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Louisiana School Leaders' Perceptions of K-12 Online Technology Readiness

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LOUISIANA SCHOOL LEADERS' PERCEPTIONS OF
K-12 ONLINE TECHNOLOGY READINESS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of Education, Leadership, Research, and Counseling

by

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LIST OF NOMENCLATURE

Asynchronous learning – Communication exchanges that occur in elapsed time between two or more people (ex. email, online discussion forums, and message boards).

Blended course – A course that combines two modes of instruction, online and face to- face.

Blended learning – Blended learning is any time a student learns at least in part at a supervised brick-and-mortar location away from home and at least in part through online delivery with some element of student control over time, place, path, and/or pace; often used synonymously with Hybrid Learning.

Content repository – A venue for saving and sharing content. A digital content repository is an online venue for saving and sharing digital content.

Digital literacy – Digital literacy is the ability to locate, organize, understand, evaluate, analyze and create information using technology.

Distance education – General term for any type of educational activity in which the participants are at a distance from each other--in other words, are separated in space. They may or may not be separated in time (asynchronous vs. synchronous).

Distributed learning – Any learning that allows instructor, students, and content to be located in different locations so that instruction and learning occur independent of time and place; often used synonymously with the term “distance learning”.

Hybrid learning - Instructional course wherein 25%-50% of face-to-face interaction is replaced with online activities; often used synonymously with Blended Learning.

Instructional media – The materials that teachers use to teach and students use to learn (i.e. printed text, digitized text, software, speech, and images).

Learning Management System (LMS) – The technology platform through which students’ access online courses. A LMS generally includes software for creating and editing course content, communication tools, assessment tools, and other features for managing the course.

Learning object – An electronic media resource (or digital file; or collection of files) targeting a lesson objective, standard, or a lesson concept, that can be used and reused for instructional purposes.

Learning object repository – A space for storing digital learning resources.

Multi-district virtual high school – An online program administered by, and serving, multiple districts, often organized in a formal consortium. (Not to be confused with a district program that serves students from many schools.)

Online school – A formally constituted organization (public, private, state, charter, etc.) that offers full-time education delivered primarily over the Internet.

State virtual schools – Virtual schools created by legislation or by a state-level agency, and/or administered by a state education agency, and/or funded by a state appropriation or grant for the purpose of providing technology opportunities across the state. They may also receive federal or private foundation grants, and often charge course fees to help cover their costs.

Synchronous learning – Technology in which the participants interact at the same time and in the same space.

Technology facilitator – This person provides training and support for technology and administrative applications.

Threaded Discussion – A forum that includes a running commentary of messages used by a group to facilitate asynchronous online discussions.

Transformational Leadership – A process in which leaders and followers help each other to advance to a higher level of morale and motivation (Burns, 1978).

Video conferencing – Interactive communication technologies that allow two or more locations to interact via two-way video and audio transmissions simultaneously.

Virtual class – A group of students assigned to the same online course.

Webinar – A seminar that is conducted over the World Wide Web. It is a type of web conferencing. A webinar is “live” in the sense that information is conveyed according to an agenda, with a starting and ending time.

ABSTRACT

The purpose of this quantitative, descriptive study was to gain perspective of Louisiana public school leaders' perceptions of their levels of preparedness to effectively integrate technology into their schools as a major component of their educational program. This research was guided by two overarching questions: (1) What is the perceived technology leadership preparedness level of Louisiana public school leaders as measured by their responses to the 2009 ISTE NETS-A standards? (2) Are there significant differences in how school leaders' self-report on NETS-A standards by BESE state region? Results of this study indicate that school leaders, throughout all eight Louisiana BESE state geographical regions, perceive themselves to be moderately competent and prepared to provide effective technology leadership in an increasingly technological learning context. One region significantly differed from the seven other regions, with participants consistently rating themselves higher than other regions on all six categories of educational technology leadership.

CHAPTER 1 OVERVIEW

Introduction

Technology has become an increasingly prominent feature of 21st century K-12 public education. According to Toch (2010) “we're headed to a world of ‘adaptive content libraries’ and ‘recommendation engines’ that string together customized ‘playlists’ of learning activities for every student every day, on-demand tutoring, and ‘hybrid’ education that weaves together live instruction and technology” (p. 72). The increasing prevalence of technology within the school environment increases the need for teachers and school leaders to be proficient in the use and applications of educational technology.

The effective use of educational technology in public schools can vary widely, not only between districts, but within districts, and even within individual schools and departments. Educators widely utilize educational technology at different levels and for different purposes (Rousmaniere, 2013). Throughout Louisiana, educators are required to use technology for instructional purposes and administrative duties. Teachers and school leaders who are technologically proficient are encouraged by state and local systems to expand upon common uses and to experiment with procedures, applications, and instructional functions. Such uses include increased student engagement, instructional differentiation, and efficient communication (Abbott, Greenwood, Buzhardt, & Tapia, 2006).

Although the Louisiana Department of Education (LDE) provides online technology guidelines and resources for educational technology usage, the school leader has a critical impact concerning the extent to which technology will be utilized to improve student achievement (Romano, 2003). When educators lack self-efficacy with technology, many full-featured computer resources remain unused.

Current education preparation programs in Louisiana, including InTech for teachers and Leadtec for administrators, have a narrow range of options in their course offerings. This study operated under the assumption that school leaders provide an environment wherein technology may or may not be considered an essential feature of the school-wide instructional program. School leaders' technological self-efficacy served as a model for classroom teachers to follow. This study was designed to ascertain the levels of self-efficacy among school leaders throughout the state of Louisiana using the Principal Technology Leadership Assessment (PTLA).

Many factors affect frequency and quality concerning technology use in schools and classrooms. Though utilization of educational technology is pervasive, choosing appropriate digital resources and using them effectively is necessary if investment in technology is to positively impact learner outcomes. Simply possessing technological resources without proficient skills with which to use them might result in schools and districts suffering a net loss on their investment. According to Watson and Kalmon (2005), the success with which educators progress toward instructional goals may be associated with levels of appropriate training and involvement with the digital tools that they are given.

The concept of educational technology involves more than instructional content delivery; it encompasses all aspects of education that directly and indirectly affect student learning. Educators have a rapidly growing variety of technological resources on which they can rely to potentially enhance and improve the traditional instructional process. The extent to which educators are utilizing such resources to effectively engage students is the subject of a growing body of educational research (Watson & Kalmon, 2005).

The Principal's Role in Implementing Change

The introduction of new instructional technologies has empowered teachers to engage students in a myriad of learning modalities that encompass both synchronous and asynchronous learning environments. Today, most schools have access to high-speed Internet and contemporary technological materials and components (USDE, 2015). However, the impact of such pervasive access might be mitigated due to teacher discomfort with advanced tools, resulting in minimal usage of available services and applications. Petzko (2008) asserted that new school leaders view technology leadership to be both useful and necessary; however, these same leaders are not adequately prepared to provide effective leadership in technology integration throughout each individual school classroom. To achieve effective utilization of technological resources, faculty must receive adequate professional development, and the school principal is a crucial broker of this resource (Schiller, 2003). Teachers require basic knowledge of technological resources, how to utilize them, and how to integrate them into the existing curricula. Therefore, an essential role of a school principal in implementing educational change is through the provision of faculty professional development for teachers' growth (CEO Forum, 2000).

A school principal is typically required to possess a master's degree in education administration (USDE, 2015). The roles of a principal in a school include organizational administration and instructional leadership and require principals to manage school operations, supervise staff, coordinate daily activities, and to develop curricula. Responsibilities for principals are dynamic and have evolved over the past two decades due to performance accountability policies and technological advancements. The changes have sculpted the duties of leadership positions wherein academic gains are assessed more through online platforms for

benchmark and summative testing and require modals of instruction to meet the ever-changing, technology-laced landscape of assessment. Challenges that principals face often require creativity and problem-solving skills (Rousmaniere, 2013). The school leader champions the implementation of program reforms, models behavior, and develops organizational vision (Lee, Alvoid & Black, 2014). As public education evolves technologically, it is the principal who, ultimately, must facilitate the process.

A principal's provision of staff development is critical to the implementation of change as the staff acquires knowledge and skills to improve a school's capacity (Abbott, Greenwood, Buzhardt, & Tapia, 2006). The principal has a role in establishing a collaborative culture that motivates other staff to work towards the achievement of the change goals. Championing the voice of what is needed to become a 21st century digital learner and communicating that message through targeted professional development and daily usage dynamics is paramount to assuring buy-in from both teachers and students. Through the empowerment of teachers and delegation of duties and authority, trust may be achieved, thus helping to facilitate educational change (Rousmaniere, 2013). Principals have the additional responsibility of disseminating and necessary information through a variety of channels in an ongoing basis. A principal may better achieve goals by gaining staff cooperation, rather than direct staff control. This can be achieved through the practice of shared decision-making, which can lead to shared responsibility with the goal of shared ownership. Successful principals recognize the value of each individual and build a collaborative culture among the teachers, students, and support staff (Abbot et al., 2006). A principal may best view development of personnel as an on-going, school-wide activity. The principal plays a role in providing staff development through skills professional development in order to improve the instructional leaders' ability to successfully implement educational change.

The Importance of Technology

Educational Technology (also referred to as Virtual learning, Cyber learning, and e-Learning) can be defined as “Education in which instruction and content are delivered primarily over the Internet” (Watson & Kalmon, 2005). The National Association of Independent Schools (NAIS) defined technology as “any course or program conducted outside of the physical classroom using Internet-based technology for instruction” (Insightlink, 2010, p. 1). For well over a decade, technology has influenced how schools have operated and extended their reach from traditional brick and mortar settings to anytime/anywhere learning opportunities. Picciano and Seaman (2008) conducted two surveys of public school district leaders throughout the nation to find out how many K-12 students were enrolled in online courses. Seven hundred students were involved in the first study. When the study was repeated two years later, the number of students had almost increased to 1,030,000. They also found that three fourths of all U.S. public school districts were providing online education. Survey responses indicated that the enrollment trend would continue and there would be a significant increase in both students and districts participating in online education in upcoming years.

Wherein a traditional classroom setting may incorporate a grade for student participation that quantifies the informal discussion and observed group dynamics within class exercises, Gibson and Dunning (2012) pointed out that the online environment might utilize blogs and wikis to supplant such informal discussions. "Incorporating new features will further advance the mechanisms in course design to allow more synchronous and asynchronous activities, leading to even greater co-mingling of high-tech and high-touch characteristics in our online coursework" (Gibson & Dunning, 2012, p. 218).

Nationally, technology advocates such as the International Society for Technology in Education (ISTE), Computing Teachers Network (CTN), Digital Citizenship Network (DCN), Early Learning & Technology Network, Librarians' Network, and the Virtual Environments Network have supported increased expenditures for online accessibility in public schools. (Gibson & Dunning, 2012, p. 210). Online distance education courses, computer-based testing and social media forums have greatly expanded within school settings, but many students' use of these innovations are still limited. While many dollars have been earmarked for this purpose, infrastructure, teacher training, and device availability remain a concern at the local school level (ISTE, 2014). States and school districts are at varying degrees of readiness for full technology integration, and while the lure of full distance capabilities is enticing, the plausible reality of its implementation remains in question (Anderson, Augenblick, DeCesare, & Conrad, 2006).

Transformational Leadership for Technology

Burns (1978) first introduced the concept of transformational leadership, describing it as process by which "leaders and followers raise one another to higher levels of morality and motivation" (p. 20). In his groundbreaking book *Leadership* he explained that the leader's fundamental act is to induce people to be aware or conscious of what they feel -- to feel their true needs so strongly, to define their values so meaningfully, that they can be moved to purposeful action" (p. 43).

Bass (1999) further explained, "Transformational leadership refers to the leader moving the follower beyond immediate self-interests through idealized influence (charisma), inspiration, intellectual stimulation, or individualized consideration" (p. 11). Leadership research may distinguish leaders by style, however, regarding transformational leadership theory,

“Transformational leaders can be directive or participative, authoritarian or democratic” (Bass, 1999, p. 13).

“A central tenet of the transformational approach is that such effects are transmitted through follower reactions to a leader” (Piccolo & Colquitt, 2006, p. 327). Wofford, Whittington, and Goodwin (2001) found in their research that “the set of behaviors that is labeled transformational leadership includes those that are manifest with some consistency to all the members of a group; yet, on the other hand, some of the behaviors are used with some followers more than with others” (p. 208). When leaders provide individualized consideration to subordinates, “employees develop enhanced self-confidence through supervisors' efforts directed at esteem building” (Dubinsky, Yammarino, & Jolson, 1995, p. 318). Inspirational leaders, “through emotional support and emotional appeals, inspire their personnel to exceed initial motivational expectations” (Dubinsky et al., 1995, p. 317).

Statement of the Problem

Currently, literature concerning the effectiveness of transformational leadership within the context of technology organizations has much room for growth (Hambey, O'Neill, & Kline, 2007; Ji & Chuang, 2012). Regarding virtual learning, transformational leaders may effectively lead teams toward successful goal achievement by facilitating practices that motivate and encourage followers (Huang, Kahai, & Jestice, 2010). By building such organizational structures, leaders may produce changes in followers that enhance their capabilities as a group.

Studies concerning school leaders' ability to effectively integrate technology into their schools typically reference the ISTE Standards for Administrators. There is a lack of definitive research on the impact of transformational leadership as it relates to the integration of technology as a major component of the public high school environment. The purpose of this study was to

determine the perceptions school leaders have of their technology leadership preparedness based on the 2014 ISTE Standards for Administrators.

Due to a lack of conclusive research on the topic, the current state of principal preparedness for implementation of technology is not clearly defined. Principal preparation programs vary over time, suggesting an inherent difference in training between veteran principals and those new to the school administration (McQuiggan, 2007). State support may be useful for providing guidelines, however, such guidelines are not tools for principal training in the implementation of technology and all that it encompasses. Independent organizations, such as ISTE, do provide training opportunities, however, principal participation in such training is strictly voluntary and often costly in terms of time and financial resources (ISTE, 2014). It is not clear where principals gain the knowledge or skills specific to technology and how to specifically implement technology at their schools. This study sought to provide insight into the current condition of Louisiana school leaders' readiness to implement technology and to share principal insights into what might help to advance their levels of preparation.

Significance of Study

Due to increasing federal and state mandates to improve student outcomes at a time when educational funding is decreasing, it is necessary for educational leaders to restructure existing frameworks to increase school capacity to meet the demands of the twenty-first century. Educational leaders and policy makers need guidance to make informed decisions that will allow them to increase capacity through technology. Results may inform understanding of how public school leaders perceive their levels of preparation to successfully integrate technology into their school programs, particularly as they relate to programs, through the lens of transformational leadership. This study contributes to the body of knowledge concerning school leaders' roles in

supporting technology in schools and how transformational leadership may advance their efforts in doing so.

Purpose of Study

The purpose of this quantitative, descriptive study was to gain perspective of Louisiana public school leaders' perceptions of their levels of preparedness to effectively integrate technology into their schools as a major component of their educational program.

Research Questions

This research was guided by the overarching question(s): What is the perceived technology leadership preparedness level of Louisiana public school leaders as measured by their responses to the 2009 ISTE NETS-A standards and are there significant differences in how school leaders self-report on NETS-A standards by BESE state region? The following sub-questions added clarity:

1. To what degree do school leaders perceive meeting the NETS-A standards? The standards are:
 - a. Leadership and Vision
 - b. Learning and Teaching
 - c. Productivity and Professional Practice
 - d. Support, Management, and Operations
 - e. Assessment and Evaluation
 - f. Social, Legal, and Ethical Issues (ISTE, 2002)
2. Are there significant differences in how school leaders self-report on NETS-A standards by state region?

Methods

participants.

The population included Louisiana public school leaders.

data collection and instrumentation.

Participants were administered the University Council for Educational Administration (UCEA) Principal Technology Leadership Assessment (PTLA) Survey via email. Participants were contacted within two weeks of the initial email to remind them of the survey and encourage their participation. The PTLA survey was selected based on its validity and reliability, in addition to its alignment with the ISTE Standards for Administrators. The primary goal was to identify the perceptions of readiness according to Louisiana public school leaders to successfully integrate technology into their school-wide programs.

procedures.

Permission to conduct the research was requested from the Instructional Review Board (IRB) to conduct research at Louisiana State University, using a standard form for this purpose. The researcher provided a written statement for all survey participants stating they were guaranteed anonymity. No participant was identified by name, and each survey was coded with a participant number.

data analysis.

Based upon responses to the survey, descriptive statistics were used to analyze mean scores for perceptions of readiness along the dimensions of: Leadership and Vision; Learning and Teaching; Productivity and Professional Practice; Support, Management and Operations; Assessment and Evaluation; and Social, Legal, and Ethical Issues. Pedagogical, social,

managerial, and technical aspects of distance education implementation were utilized as the framework for making meaning of survey responses.

Chapter Summary

Current advancements in online technology have created opportunities for school leaders to increase the breadth and depth of course offerings to a wider range of students through the integration of technology into their school programs. However, it is unclear the extent of preparedness school leaders have with which to take advantage of such opportunities. Although current university administrative preparation programs have increasingly incorporated technology training into their programs (Laird, 2004), many veteran principals were not likely to receive such training in programs. Among new school leaders, even such technology training may not be sufficient to prepare them to successfully manage technology in school systems that operate primarily traditional instructional programs. In order to support schools and school systems in this effort, ISTE has developed nationally accepted standards for technology integration. Don Knezek, President of the International Society of Technology Education (ISTE), asserted that since school principals have an influential role in the implementation of school reforms, their beliefs concerning technology integration are of crucial importance (ISTE, 2002). Integration of new technological developments into education should enable students to make use of new technologies just as easily as they make use of other educational tools such as books, maps, and pencils (Fakir & Yildirim, 2009).

The purpose of this quantitative, descriptive study was to gain perspective on Louisiana public school leaders' perceptions of their levels of preparedness to effectively integrate technology into their schools as a major component of their educational program. This quantitative research gathered data from public school leaders throughout the state, using the

PTLA survey. The results inform educational leaders on the types of training needed to support school leaders in their efforts to build capacity in their schools through the inclusion of technology.

CHAPTER 2

LITERATURE REVIEW

Introduction

The introduction of interactive and dynamic media technologies, supported via increased broadband networking capabilities, has prompted research concerning potential enhancements to the K-12 educational environment. Such enhancements provide opportunities to improve teacher quality, refine organizational institutions, and engage students in more meaningful forms of learning. According to Ajjan and Hartshorne (2008), educators, teachers, and researchers consider technology to be an indicator of high quality in education. The concept of expanding upon the traditional face-to-face interactions that have characterized the contemporary learning environment into the virtual sphere is an inherently inclusive one. That is to say, what may appear to be a depersonalization of the traditional classroom may in fact provide opportunities for more personalized learning.

Technologies cause disruptive changes that require a rethinking of nearly all elements of the education system (McLeod, Richardson, & Bathon, 2011). Communication over a network that includes text, audio, and video media may also include pre-recorded lectures, individualized assignments, and freedom from physical and social barriers that often impede the learning process in large classroom groups. Challenges to implementation of such instructional innovations include: the selection of technological tools, organization of resources, pedagogical adaption, consistency of practice, and measurements of effectiveness. Each of these challenges must be negotiated within the framework of organizational leadership and development. Within the past 20 years, long-held standards for leadership involving work-group dynamics have not necessarily corresponded with the ever-growing need for leadership in groups that communicate significantly through technology-mediated forms. For successful integration of technology into a

school-wide program, school leaders must identify student needs, existing resources, technology-related educational needs, and technology design. It is also necessary to secure guidance and technical support for teachers in their use of technology (Yidrum, 2007).

According to Prensky (2009), a relatively small percentage of educators use technology effectively with improved outcomes in schools and classrooms. Educators tend to evolve throughout four stages of technology proficiency: superficial use of computers out of curiosity; continuing traditional practices in slightly different ways with the use of technology; continuing traditional practices in significantly different ways aided by technology; and implementing new, innovative practices in different ways, fully deploying available technological resources. Prensky (2009) found that many educators become “permanent beginners” with technology, utilizing it for only four things: exhibiting supplemental media from the textbook cd, exploring available websites related to the current lesson, delivering lectures, and using the computer as an advance type of overhead projector.

Transformational Leadership

According to Bass (1999) “Transformational leadership refers to the leader moving the follower beyond immediate self-interests through idealized influence (charisma), inspiration, intellectual stimulation, or individualized consideration” (p. 11). Leadership research may distinguish leaders by style, however, regarding transformational leadership theory, “Transformational leaders can be directive or participative, authoritarian or democratic” (Bass, 1999, p. 13).

“A central tenet of the transformational approach is that such effects are transmitted through follower reactions to a leader” (Piccolo & Colquitt, 2006, p. 327). Wofford et al. (2001) found in their research that “the set of behaviors that is labeled transformational leadership

includes those that are manifest with some consistency to all the members of a group; yet, on the other hand, some of the behaviors are used with some followers more than with others” (p. 208). When leaders provide individualized consideration to subordinates, “employees develop enhanced self-confidence through supervisors' efforts directed at esteem building” (Dubinsky et al., 1995, p. 318). Inspirational leaders, “through emotional support and emotional appeals, inspire their personnel to exceed initial motivational expectations” (Dubinsky et al., 1995, p. 317).

The mere presence of a transformational leader may not be enough to help a school adapt to the new context of technology, even if the leader possesses expertise in organizational development. Shankar, Eastman, and Eastman (1997) explained, “the correspondence between organizational context (level of organizational receptivity) and the type of transformational process is important” (p. 103). Wofford, Whittington, and Goodman (2001) found that, concerning followers of transformational leaders, “the motive patterns appear to affect the outcomes of transformational leadership” (p.207). Shankar et al. (1997) proposed “the context influences organizational receptivity to transformational leadership” (p. 101). Wofford et al. (2001) found “situational moderators operating even within relationships of leadership, motive patterns, and criteria when all were reported by followers” (p. 207). Dvir, Eden, Avoli, and Shamir (2002) found in their study on follower development and performance that under stressful organizational circumstances, “positive transformational leadership effect may be evidenced by halting motivational, moral, or empowerment decline among followers” (p. 742).

In their study on relationships between leadership behaviors and extraordinary follower performance, Kirby, Paradise, and King (1993) found that “followers prefer leaders who engage in the transformational behaviors associated with individualized consideration, intellectual stimulation, and the transactional behavior of contingent reward” (p. 309). Bono & Judge (2003)

asserted, “external factors (such as transformational leaders) can influence the extent to which individuals perceive their work activities to be important and self-congruent” (p. 568). “By appealing to followers' ideals and values, transformational leaders enhance commitment to a well-articulated vision and inspire followers to develop new ways of thinking about problems (Piccolo & Colquitt, 2006, p. 327). In their study of follower motive patterns, Wofford et al. (2001) found that “followers with higher autonomy needs had stronger relationships between their perceptions of transformational behaviors of their leaders and these leaders' effectiveness than followers with lower autonomy needs” (p. 208). The ways in which authority is dispersed throughout an organization also influences leader effectiveness. “Power concentration and organizational capacity, which includes organizational expertise and transformational leadership, are the factors that enable the attainment of the desired reorientation” (Shankar et al., 1997, p. 102).

Although organizations have short-term needs and concerns, a transformational leader focuses on how all decisions tie into the future of the organization. “Transformational supervisors adopt a long-term perspective” (Dubinsky et al., 1995, p. 316). Kirby et al. (1993) found that “encouraging and expecting followers to challenge their old ways of doing things were key ingredients in extraordinary leadership” (p. 310). Bono & Judge (2003) pointed out the importance of “teaching leaders to explicitly discuss links between job tasks and the broader purpose and vision of their organization with their followers” (p. 569).

According to Piccolo and Colquitt (2006), “Day-to-day job assignments and interactions could be altered with the goal of using transformational actions to stretch followers in such a way that perceptions of the core characteristics are fostered” (p. 337). Piccolo and Colquitt (2006) suggested that “leaders can influence perceived core characteristic levels by changing the

language, imagery, and symbols used to communicate meaning on the job” (p. 337). According to Bono & Judge (2003), “Increasing employees' identification with their work (by training leaders) might be particularly valuable in organizations engaged in large-scale (or continuous) change” (p. 569). Kirby et al. (1993) surveyed followers concerning their perceptions of leaders and found that “opportunities for professional growth and development were paramount issues in educators' reports of extraordinary leaders” (p. 310). Dvir et al. (2002) asserted, “transformational leadership, enhanced by training, can augment the development of human resources and their performance in a variety of organizational contexts” (p. 743). Shankar et al. (1997) asserted, “transformational leaders can adopt an appropriate transformational process to harness or destroy the context to make it an effective vehicle for the transformational tasks” (p. 101).

Piccolo and Colquitt (2006) recommended that organizations build a “transformational component into the yearly developmental assessments (e.g., managerial skills surveys, 360-degree feedback instruments) that leaders fill out” (p. 338) to make the leadership improvement process continuous. Highly skilled transformational leaders may best facilitate the context of a nonlinear shift to technology throughout a statewide system of public schools.

Although transformational leadership emerged from the same research activity in the early 1980s that brought forth the theory of instructional leadership, it did not become widely accepted until the early 1990s. This was largely in response to critique of the top-down approach of instructional leadership that had been in practice the previous decade (Hallinger, 2003). Proponents of holistic organizational development advocated for the shared leadership inspired by the transformational leadership framework. Leithwood (1998) presented a model that

included individualized support, group vision, culture building, and high expectations. This model situates the principal at the center of the organization rather than the top.

Through the diffusion of power, the commitment to change may be solidified, increasing teacher efficacy and furthering progress toward the goals of change (Abbott et al., 2006). The principal may form work groups that involve the teachers, staff, community, and the parents. By delegating powers and authority to such groups, they can help guide and support the principal in various situations. As facilitators of change, principals often present themselves as motivators and cheerleaders, supporting and encouraging the efforts of the teachers (Payne, 2000). This may include rewarding teachers who support change and implement it to their fullest capabilities.

School principals play essential roles in the implementation of change as facilitators and directors of change. They provide access to both tangible and intangible resources toward these ends. A principal may best achieve change goals through the adoption of various roles. Accepting such responsibility and leadership roles are critical factors that aid in facilitating the process of change. Principals may achieve collaboration through shared decision-making and shared responsibility, hence developing a sense of shared ownership among the staff (Abbot et al., 2006). In their roles as motivators, principals may reward supporters of change throughout their staff, using diffusion of power and shared leadership to increase and solidify the staff and the community's commitment to change.

Transformational leadership shares much in common with another theory, transactional leadership; transactional leadership, however, emphasizes management of an existing culture, whereas transformational leadership emphasizes the creation of a new culture. As it applies to the movement of a school from a long-standing traditional approach to instruction to one that both integrates and evolves with technology, it would appear that a new organizational culture

would have to be created, maintained, and recreated over the long run. Such ongoing change requires all aspects of the organization (e.g. resources, professional development, and staff cooperation, etc.) and it may be necessary for cooperation among all principal actors, and teachers in particular. As Hallinger (1998) pointed out, "Because teachers themselves can be barriers to the development of teacher leadership, transformational principals are needed to invite teachers to share leadership functions" (p. 343). Hallinger (1998) argued that neither instructional leadership nor transformational leadership is an inherently better leadership style, but that either may be better suited for particular school contexts.

In his article "Leading Educational Change," Hallinger (2003) explored similarities and differences between instructional and transformational leadership. "The popularity of the instructional leadership construct arose in North America during the 1980s along with that of its progenitor, the effective schools' movement" (Hallinger, 2003, p. 342). The instructional leadership model describes the principal as having expertise in curriculum, instruction, and pedagogy. The principal as instructional leader is responsible for making choices regarding the instructional curriculum. This requires knowledge of research, contemporary programs, and skill concerning instructional resources. Such a leader must also provide professional development and monitor the implementation of instructional practices. Furthermore, instructional leadership requires assessment of program effectiveness, which may require mastery of assessment tools. With regard to technology implementation, instructional leadership provides many facets that may be useful with helping teachers to integrate technology into their classroom practices. Because instructional leadership substantially narrows the principal's focus, an organization may require a requisite level of functionality for this type of leadership to be effective. Hallinger (2003) suggested that the school's context largely determines the principal's ability to employ meaningful instructional leadership.

Leithwood and Jantzi (1999) conducted research on the effects of transformational leadership on school organizational conditions and student engagement. According to the authors, the impetus for this study was the exploration of leadership effectiveness on factors beyond those of math and language achievement scores. The authors asserted that a myriad of factors influence student academic achievement, leaving doubt as to the precise impact that principal leadership might have. Leithwood and Jantzi (1999) pointed out that principals have direct control over some aspects of school organizational conditions, but not all. These conditions are generally accepted to influence student outcomes to varying degrees. The authors considered theories that suggest leadership might hold somewhat symbolic value for more complex processes that interact to produce results in schools.

Citing established literature on the relationships between student engagement and academic outcomes, Leithwood and Jantzi (1999) explored possible causal relationships between transformational leadership and student engagement. Using survey data from a school district, the researchers found small causal relationship between principal leadership and student engagement, writing, "results of the study indicate that transformational leadership effects are significant although weak on the affective or psychological dimension (identification) and the behavioral dimension (participation) of student engagement" (p. 18). The authors compared this effect with the substantially larger impact of family educational culture on student engagement.

Leithwood and Jantzi (1999) suggested that a school principal's ability to affect school organizational conditions might not be sufficient to accomplish the school's academic goals. The authors suggested, rather, that principals consider the benefits of working with families to enhance the home academic environment, which may have a positive effect on student academic outcomes. Leithwood and Jantzi (1999) asserted support for transformational leadership as an

effective approach to school development and called for a data-supported approach to its implementation as part of the complex system of education.

In their study on the comparative effectiveness of instructional and transformational leadership in schools undergoing restructure, Marks and Printy (2003) examined leadership impacts on student outcomes in elementary, middle, and high schools. Instead of the traditional scope of instructional leadership, which situates the principal atop a hierarchical structure, the authors presented the concept of "shared instructional leadership," a somewhat hybrid model of both instructional and transformational leadership styles. As Marks and Printy (2003) explained, "Whereas the principal remains the educational leader of the school, teachers, who have requisite expertise or information, exercise leadership collaboratively with the principal" (p. 374). Additionally, Marks and Printy (2003) presented a less-traditional view of transformational leadership, wherein the principal not only organizes the group around common goals and practices, but also takes responsibility for instructional leadership. "When principals who are transformational leaders accept their instructional role and exercise it in collaboration with teachers, they practice an integrated form of leadership" (p. 367). This study suggested that narrow applications of either instructional or transformational leadership are inadequate for substantial improvements in schools with significant academic or organizational deficiencies. The researchers recommended an integrated approach to leadership that is instructionally directive, but empowers teachers to take leadership roles throughout implementation.

In their investigation into the impact of school leadership on student achievement, Leithwood, Patten, and Jantzi (2010) presented a construct of principal influence as a four-path model. This model consisted of four types of paths, including: Rational, Emotional, Organizational, and Familial. Each path consisted of variables that have differing levels of impact on student achievement. This framework was based upon established research and was

utilized by the authors to measure size effects of variables within each path. The significance of such a study was its usefulness as a guide for school leaders to best focus their time, efforts, and resources on those variables within each pathway most likely to impact student achievement. Leithwood et al. (2010) expressed skepticism about current efforts to narrowly define principals as instructional leaders, to the exclusion of other roles and tasks that research suggests have greater impacts upon student academic outcomes.

According to Leithwood et al. (2010), the Rational path consists of teacher knowledge of effective classroom practices for student engagement and behavioral management. The Emotional path consists of teacher feelings and beliefs about themselves in relation to the school vision and their sense of efficacy. The Organizational path consists of school structure, particularly relating to teacher planning, collaboration, and reporting. The Family path consists of both factors outside of school control, such as socio-economic status, and those within the school's control, such as communication with parents. The results of this quantitative analysis revealed that the greatest paths of influence, from greatest to least, were Family, Rational, Emotional, and Organizational.

Within each path, certain variables stood out as dominant in their influence on student achievement. The authors pointed out that school context largely determines specific levels of influence and that there is need for additional research to further refine the variables within each path. However, due to the robust body of evidence upon which the Four Paths Model is built, it appears to be a useful tool for school leaders to employ as a framework for guiding plans of action for improving student achievement. The authors suggested, "Over an extended period of time, leaders should attend to variables in need of strengthening on all Paths" (Leithwood et al., 2010, p. 673).

Vision for Technology

Because of the rapidly changing nature of technology, school leaders are called upon to develop a vision for enriching the educational environment through technology. Articulation for such a vision is required by the Louisiana Department of Education in the form of a school technology plan (LDE, 2007). Within the school technology plan is a section that asks for the school's vision statement. A full vision statement for use of educational technology is inclusive of concerns beyond the simple acquisition of computer devices and software (Vanderlinde, 2012). Vision for a school's educational technology implementation includes descriptions of how faculty and administration will utilize the technology and how students will interact with technology to enhance their learning.

When such a vision is developed by a school team and shared with the faculty, it is more likely to be embraced than when the process is limited to a top-down approach (Davies, 2012). Whitehead (2003) asserted that school leaders must be invested in technology in order to persuade others to fully commit to the school's technology program. It is important, however, that once the technology plan is established and in practice, that the school leader follows up with ongoing training and evaluations of technology usage (Whitehead, 2003).

Educational Technology

The research consortium Insightlink (2010) reported, "There is a general consensus throughout the literature that technology in all of its forms is growing steadily" (p. 3). Technology (also referred to as Virtual learning, Cyber learning, and e-Learning) can be defined as "Education in which instruction and content are delivered primarily over the Internet" (Watson & Kalmon, 2005, 117). The National Association of Independent Schools, (NAIS) defined technology as "any course or program conducted outside of the physical classroom using

Internet-based technology for instruction” (Insightlink, 2010, p. 1). For well over a decade, technology has influenced how schools operate and extended their reach from traditional brick and mortar settings to anytime/anywhere learning opportunities.

Picciano and Seaman (2008) conducted two surveys of public school district leaders throughout the nation to find out how many K-12 students were enrolled in online courses. With the first study, 700,000 students were involved. When they repeated their study two years later, the number of those students had almost increased to 1,030,000. Their research also found that three fourths of all U.S. public school districts were providing online education. Survey responses indicated that the enrollment trend would continue and there would be a significant increase in both students and districts participating in online education in upcoming years.

A prominent feature of technology is the variety of ways in which it can be implemented. "The first computer-assisted courses, based on the use of simulations and multimedia applications, created the conditions necessary to be able-under the growing influence of the constructivist approach-to take advantage of new opportunities for the development and consolidation of online teaching and learning" (Espasa & Meneses, 2010, p. 278). Students participate in online education through blended-learning classrooms, school district virtual courses, dual enrollment partnerships between school districts and universities, and virtual schools run by private organizations, institutions of higher education, and state departments of education. Online education has received widespread support and is used in all levels of education.

Wherein a traditional classroom setting may incorporate a grade for student participation that quantifies the informal discussion and observed group dynamics within class exercises, Gibson & Dunning (2012) pointed out that the online environment might utilize blogs and wikis to supplant such informal discussions. "Incorporating new features will further advance the

mechanisms in course design to allow more synchronous and asynchronous activities, leading to even greater co-mingling of high-tech and high-touch characteristics in our online coursework" (Gibson & Dunning, 2012, p. 218).

Nationally, technology advocates such as the International Society for Technology in Education (ISTE), Computing Teachers Network (CTN), Digital Citizenship Network (DCN), Early Learning & Technology Network, Librarians' Network, and the Virtual Environments Network have supported increased expenditures for online accessibility in public schools. "The first National Association of Schools of Public Affairs and Administration (NASPAA) conference panel dedicated entirely to Internet-mediated instruction in public affairs was held in 1994 and, in 1998, NASPAA accreditation standards were revised to include distance education" (Gibson & Dunning, 2012, p. 210). Online distance education courses, computer-based testing, and social media forums have greatly expanded within school settings, but many students' use of these innovations is still limited. While many dollars have been earmarked for this purpose, infrastructure, teacher training and device availability remain a concern at the local school level (ISTE, 2014). States and school districts are at varying degrees of readiness for full technology integration, and while the lure of full distance capabilities is enticing, the plausible reality of its implementation remains in question (Anderson, Augenblick, DeCesare, & Conrad, 2006).

Devaney (2008) described 21st century learning skills as a new standard for alignment of K-12 education coursework to the demands of the modern workforce. The 21st century learning skills are a combination of content and performance skills including: critical thinking, problem solving, collaboration, communication, creativity, and technological proficiency (Devaney, 2008). In this new standard, students are expected to be competent at skill-based tasks with less focus on rote memorization of information. "Today's online course design cannot simply be

moving the material from the lectern to the computer screen, given the expectations of students and the versatility of the electronic world" (Gibson & Dunning, 2012, p. 218).

As Pearson (2010) pointed out, "students of all ages and backgrounds have begun to expect to use technology in their classrooms, whether or not they are well-versed in its use" (p. 207). "Although the wiki space is free and easy to use, the instructor still needs to train students at the beginning of the class and answer additional wiki-related concerns throughout the class" (Hu & Johnston, 2012, p. 501). In their study on online instruction, Ginn and Hammond (2012) identified challenges including a lack of interest on part of some students and teachers in adapting to an online environment, difficulty for teachers to identify particular student characteristics without face-to-face interactions, and an absence of group cohesion. "A lack of technology skills also can be very frustrating to a student who is asked to submit an assignment online but who doesn't know the basics of word-processing, presentation, or other software" (Rao et al., 2011, p. 25). Pearson (2010) found in her research on using blogs as an instructional tool that "Many students were well versed in the use of MySpace or Facebook, but had not ventured into the blogosphere" (p. 212). "The digital divide, seems to contradict the view that online education helps provide or expand educational access to underserved individuals" (Ginn & Hammond, 2012, p. 250). "To be successful in online coursework, students need to be relatively technologically savvy, self- disciplined, and capable of absorbing difficult material independently" (Ginn & Hammond, 2012, p. 268). "Online education is not for everyone and independent students with self- motivation are more likely to succeed in this environment than others" (Ginn & Hammond, 2012, p. 262).

Rao et al. (2011) pointed out that "a lack of bandwidth or an unreliable Internet connection makes it difficult, if not impossible, for a student to download the necessary files for a course or

to complete assignments and upload them on time” (p. 25). Building on one of the administrative concerns, in their study of institutional costs of providing online education, Anderson et al. (2006) identified five general categories of expense: 1) management, 2) instruction, 3) course development, 4) set- up, and 5) technology personnel. The flexibility of online education provides obvious opportunities for schools and school districts to reduce their operating expenses by reducing the number of full time instructional staff.

Toch (2010) pointed out, however, “organizations that have begun to successfully educate some of the nation's 8 million disadvantaged urban students, including KIPP, Uncommon Schools, and Achievement First, have increased rather than decreased the contact between students and adults in their schools” (p. 73). Ginn and Hammond (2012) posited that there is a “need to explore appropriate methods to entice faculty to teach online; motivators may include paid time to develop courses and additional workload credits for teaching online due to the added responsibilities involved in the virtual classroom” (p. 269). Toch (2010) further asserted “the radical new notion of students as independent education entrepreneurs and schools as one of a constellation of subcontractors clearly won't work for many students” (p. 73).

Espasa and Meneses (2010) asserted that effective technology should contain three types of pedagogical assessment: continuous assessment throughout the entire teaching and learning process, regular formative assessment, and proactive regulation that consolidates the skills acquired by the student in relation to future learning. Miller (2011) asserted, “in the ideal classroom (virtual or not) public administration educators want to encourage both autonomy and connectedness” (p. 457).

According to Restauri (2004), two models for developing technology programs dominate. The first is the individual model through which the hardware and software are provided by the

institution, but the course development is at the hands of the instructors. In the individual model, challenges arise in teachers experiencing overload and burnout, lack of quality control on the course development, and disjunction in the school. The second model is the team model that provides a link between the technology staff and the teachers. In this model, teachers' focus on the instructional aspects of the technology usage and the technical aspects are the concern of the technology staff. While including more staff (i.e. the technology experts) increases the budgetary concerns, the payoff is that this model was correlated to more successful implementation of technology. Escoffery, Leppke, Robinson, Mattler, Miner, and Smith (2005) further explained that the team model delineates member roles in developing and offering online coursework. The teachers are responsible for designing and presenting lessons and assisting students.

The instructional specialists' responsibilities include assisting with lesson design, standards alignment, and material development. The multimedia personnel handle the development of web content, software applications, new software testing, and technical support. McQuiggan (2007) found that the team model is less utilized than the individual model which means that teachers have to tackle the enormous undertaking of all these above mentioned responsibilities on their own. "The most prudent course seems to be to focus on establishing hybrid schools that supplement face-to-face instruction with online offerings, especially for secondary school students" (Toch, 2010, p. 73).

In analyzing the workings of the technology community at Trinity Western University (TWU), Laird (2004) described this community as "integrated and seamless" and identified the following four clear phases of development for the "creation of an environment for supporting global education at TWU."

- 1) Development and Control – Establish a centralized, collaborative model of the design, development, and delivery of the course; create a contract to establish ownership rights, liability, and credit for the educational material.
- 2) Quality and Maintenance of Quality – Create an eCourse manual to delineate how educational materials should be developed, to set the baseline design and delivery standards, and to instill confidence in faculty members' ability to create online educational materials.
- 3) Services and Learner Satisfaction – Create a support structure for technology, called a facilitation, that makes faculty, learners, and staff equal partners.
- 4) The Technology Community – Establish "a multi-modal learning environment high on experiential, experimental, personal integration of learning in a multitude of intersecting environments (p. 3).

Gibson and Dunning (2012) explained "it is not sufficient to simply transplant traditional course material with canned lectures to an online format" (p. 210). According to Espasa and Meneses (2010) technology consists of "two basic psychological and complementary processes: one that is interpersonal in nature, sustained in interaction, confrontation and negotiation in regard to contributions from the participants in the educational activity, and another, intrapersonal process, based on individual cognitive reflection" (p. 278). Espasa and Meneses (2010) contended that, "feedback offered during the continuous assessment process (answering student doubts) is the most widespread form of feedback in online classrooms" (p. 289). "Discussion board activities usually involve not only an initial open-ended question requiring a

posting early in the week from all students but also follow up responses to one another that include their own questions and challenges to fellow students" (Gibson & Dunning, 2012, p. 217).

Many web-based interactive platforms contains video conferencing, chat rooms, and instant messaging, which can help to facilitate authentic interactions between teachers, students, and other participants without regard to physical locations. "For online students the presence of an identifiable 'class' that meets and interacts face-to-face may form the psychological core of their experience of community, even if they only view the class on a video recording" (Miller, 2011, p. 458). "Web-conferencing technology offers one kind of synchronous connection that allows us to design appropriate instruction for rural and remote learners" (Rao et al., 2011, p.25). "Quizzes and draft assignments can be programmed for immediate feedback. Multiple choice quizzes can have the correct response appear after the student has selected her answer" (Gibson & Dunning, 2012, p. 217).

A prominent feature of technology is the variety of ways in which it can be implemented. "The first computer-assisted courses, based on the use of simulations and multimedia applications, created the conditions necessary to be able-under the growing influence of the constructivist approach-to take advantage of new opportunities for the development and consolidation of online teaching and learning" (Espasa & Meneses, 2010, p. 278). Students participate in online education through blended-learning classrooms, school district virtual courses, dual enrollment partnerships between school districts and universities, and virtual schools run by private organizations, institutions of higher education, and state departments of education. Online education has received widespread support and is used in all levels of education.

Louisiana Context for Technology

The Louisiana Department of Education (LDE) provides the infrastructure for online distance learning and allocates Minimum Foundation Program (MFP) funding for state-approved providers of online distance education (LDE, 2007). LDE includes a technology unit which provides guidance to districts concerning network guidelines, computing standards, and a recommended student-computer ratio, currently 7:1 (LDE, 2014). This guidance is not enforced through regulation; however, it is in part tied to the technology readiness necessary for districts to participate in mandatory online state accountability testing during the 2015-2016 school year (Louisiana Department of Education [LDE], 2013). Because Louisiana is a largely rural state, wherein high-speed Internet access (a requirement for many emerging technology programs) presents a barrier to adherence to state technology standards (U.S. Department of Education, 2015; LDE, 2007). This is compounded by knowledge deficits by educators that can accompany low levels of technology access in such areas. Roa et al. (2011) found in their study of challenges facing rural education that “an aspect of particular importance to students from rural communities is the sense of ownership and pride in both the content and the context of what's being learned” (p. 23). A disconnect may occur when technology is a largely foreign concept.

The Principal's Role in Technology

Magjuka, Shi, and Bonk (2005) identified ten administrative concerns with online education as experienced by the administrators at Indiana University's Kelley Direct Program. The ten concerns are: a) choosing which student population to serve, b) fit of program into diploma pathways, c) defining aspects of the blended learning model including when and how often the residential component occurs, d) faculty choices, e) best use of budget in the program, f) setting the standards or framework for the course development, g) methods of fostering

interactivity, h) creation or purchase of educational materials, i) choosing a course management system, and j) roles of outside entities such as corporate partners and university alliances. The implementation of technology without such concerns being adequately addressed can result in ineffective practices that may bring into question the validity online learning as a practice. Miller (2011) pointed out that the technology environment has “often been unkindly characterized as a combination of impersonal posting of thoughts, instructor-posted review material and a greater reliance on points for interaction than skills learned” (p. 449). Ginn and Hammond (2012) asserted that online educators “must go to extensive lengths within the virtual classroom to make sure the students feel connected” (p.263). Rao et al. (2011) explained, “synchronous teaching tools and strategies allow the creation of learning communities that result in student empowerment, connectedness, and growth” (p. 25).

To provide guidance and generally accepted standards to educational technology integration, advocacy groups have offered to assist, notable among them is the International Society for Technology Education (ISTE), a group with a membership exceeding 100,000 professional educators. ISTE publishes *The Journal of Research on Technology in Education* (JRTE) and offers a variety of trainings, workshops, and professional conferences. ISTE’s *Standards for Administrators* is a nationally recognized authority on technology leadership skills. ISTE recommends five standards that were developed from “input from the field” (ISTE, 2014, p.1), the *field* ostensibly meaning practicing educators implementing technology in their districts, schools, and classrooms. This organization recommends five standards for school administrators concerning technology integration. Standard One, *Visionary Leadership*, asserts that school leaders should “inspire and lead development and implementation of a shared vision for comprehensive integration of technology” (ISTE, 2014, p.1). Standard Two, *Digital Age Learning Culture*, requires “digital-age learning culture that provides a rigorous, relevant, and

engaging education for all students” (ISTE, 2014, p.1). Standard Three, *Excellence in Professional Practice*, recommends that school leaders promote learning environments that “empower educators to enhance student learning through the infusion of contemporary technologies and digital resources” (ISTE, 2014, p.2). Standard Four, *Systemic Improvement*, calls for school leaders to “continuously improve the organization through the effective use of information and technology resources” (ISTE, 2014, p.2). The final recommendation, Standard Five, *Digital Citizenship*, states that administrators should “model and facilitate understanding of social, ethical and legal issues and responsibilities related to an evolving digital culture” (ISTE, 2014, p.2). These five standards promote an approach by school leaders that is comprehensive in its provisions for an environment that is conducive for teachers to integrate technology into instruction and safe for both experimentation and innovation.

Leadership for Technology

According to Zigurs (2003), virtual groups provide opportunity for a new understanding of leadership. Personality-based leadership models suggest that leaders negotiate group development through systems of rewards and interpersonal transactions. Online environments require different facets of leadership, proportionately in response to the amount of technology-mediated interactions. An essential consideration in this context is the way in which leaders are identified. Real-time interactions rely heavily upon socio-cultural signals, including: speech, participation structures, ways in which participants are dress, seat positioning, and a variety of other cultural norms. Such subtle cues are at least in part absent during virtual gatherings. According to Daft and Lengel’s (1984) Media Richness Theory, technology-based communication requires leaders to find other ways to distinguish themselves as heads of their groups. Ways that leaders may adapt include providing guidance throughout the group

interaction, availability to group members, and offering support to the other participants. Of the variety of leadership theories developed throughout the 20th Century, Bass' (1985, 1990, 1997) Transformational Leadership Theory has maintained widespread acceptance throughout the social, cultural, and technological changes that characterize the 21st Century workplace organization. Bass' (1985, 1990, 1997) approach allowed for complexities and dynamic structural developments that might occur within organizations. In this context a leader (as opposed to a supervisor or manager) must be able to both adapt to different situations, and to adjust to different contexts. Bass (1990) described Transactional Leadership as a situation wherein a leader becomes effective through interactions and exchanges with members of the organization. Transformational leaders, on the other hand, have the ability to adjust to changes in environments, contexts, and situations, while engaging, encouraging, and supporting team members in accordance with the current situation. Such leadership fosters collaboration for the benefit of the group's long and short-range goals and objectives. Bass (1997) asserted, however, that leaders could incorporate both transactional and transformational styles to effectively lead organizations.

Online Team Interaction

Bretz (1983) described the basic premise of group interaction as a three-step process: (1) communication of information, (2) a first response to this information, and (3) a second answer relating to the first. According to Dennis and Valacich (1999), the two types of communication in which virtual teams engage are synchronous and asynchronous. Synchronous communications include team members communicating live. This live communication may take the form of teleconferencing, videoconferencing, or text-based chat. Baker (2002) explained that synchronous communication tools allow group members to work on the same project

simultaneously. Asynchronous communications allow team members to communicate at different times, while still collaborating on a common project. Such forms of communication include e-mail, online forums, and group discussion threads (Baltes, Dickson, Sherman, Bauer, & LaGanke, 2002).

Current technological advancements have allowed for convenient access to group video conferencing, which provides, to some extent, the opportunity for leaders to enhance their presence via socio-cultural cues. Wolfe (2002) asserted, however, that the more primitive text-based online communication form might be more beneficial for virtual teams. One benefit of text-based interaction, Wolfe suggested, is that it allows time for individual reflection, and thus the opportunity for group members to be more selective about word choice than they could during face-to-face or video communications. Text-based communication may further help virtual groups to be more efficient when sharing ideas, since all members can conceivably speak at once (Griffith & Neale, 2001). Mannix, Griffith, and Neale (2002) added that text-based communication might help to mitigate the risk of relational conflicts that typically arise in face-to-face interactions.

Transactional and Transformational Leadership for Online Teams

Transactional leaders may often have to negotiate compromises with their subordinates to maintain control of the group. Such practices may help them to gain the cooperation of influential members within the team, allowing followers to be motivated by opportunities to participate in the decision-making process. As decision makers, team members can learn to repeat productive practices and discontinue those practices that have proven to be ineffective (Bass & Riggio, 2006).

Transactional leadership relies primarily upon systems of rewards and consequences, providing positive reinforcement for goal achievement, and negative feedback for failures (Bass & Riggio, 2006). The intent in this case is focused on the achievement of goals as opposed to organizational transformation (Boal & Hooijberg, 2007). Transformational leaders seek to foster intrinsic motivation among followers. This includes personal and professional growth of members, and the development of self-efficacy (Scaffidi, Abbate, & Ruggieri, 2008). According to Boal and Hooiberg (2007), transactional leaders capitalize upon capabilities that already exist among their followers, while transformational leaders attempt to guide the self-concepts of individual group members in order to incorporate new frameworks inclusive of common team goals. Such leaders connect with group members, seek their cooperation, and help them to develop an identification with the organization that transcends their individual needs. Bass (1997) discussed the idea of moving beyond the behavioral approach to organizational control to an approach that increases group identification and generates consensus between leaders and followers. This may be achieved by those leaders who lead by example, performing the roles of both leader and cheerleader in their approach to organizational development.

Currently, literature concerning the effectiveness of transactional and transformational leadership within the context of technology organizations has much room for growth (Hamby, O'Neill, & Kline, 2007; Ji & Chuang, 2012). With regard to virtual learning, both transactional and transformational leaders may effectively lead teams toward successful goal achievement by facilitating practices that motivate and encourage followers (Huang, Kahai, & Jestice, 2010). By building such organizational structures, leaders may be able to produce changes in followers that enhance their capabilities as a group. According to Sosik, Avolio, and Kahai (2010), transactional and transformational leadership in virtual groups can help to reduce corporate

inefficiencies, making teams more effective. The group processes encouraged by both transactional and transformational leadership styles are likely to prove effective with the unique challenges confronting virtual teams (Avolio, Kahai, & Dodge, 2000; Joshi, Lazarova, & Liao, 2009). Ruggieri (2009) suggested that transformational leadership might be more effective than transactional leadership with groups containing anonymous members. In such groups transformational leaders are better suited to help foster trust, performance, and job satisfaction compared to transactional leaders (Hoyt & Blascovich, 2003). Ultimately, both transactional and transformational leaders must engage in high levels of group-process facilitation with online and virtual teams (Ruggieri, 2009).

Support from the Louisiana State Department of Education

The Louisiana State Legislature has authorized eight geographical educational regions throughout the state, each with an elected representative. This governing body makes up the Louisiana Board of Elementary and Secondary Education (BESE). In accordance with Act 1465 of 1997, the BESE Strategic Plan FY 2014-2015 through FY 2018-2019 is comprehensive in nature, including goals for educator effectiveness, educational options for students, and effective management of resources. There is, however, no mention of technology as either a goal or means to achieve a goal. The researcher considers this significant, as BESE's Strategic Plan communicates priorities to the LDE and local school boards. The ubiquity of technology and its rapidly-increasing presence in social, industrial, cultural, and economic spheres suggests that it has become an inescapable phenomenon that requires some form prioritization if large-scale institutions, such as K-12 public education, to benefit from its use (BESE, 2013).

Louisiana has a technology plan on file with the USDE as part of its requirements for federal educational funding. The current technology plan is aligned to the national technology

plan, "Toward a New Golden Age in American Education: How the Internet, the Law, and Today's Students are Revolutionizing Expectations (2004)." The LDE state standards are adopted from the International Society for Technology in Education's (ISTE) "National Educational Technology Standards for Administrators (NETS-A)." The LDE statewide technology plan must be updated every four years, and the latest edition is closely aligned to the previous two versions dating back to 2003. The LDE statewide technology plan provides "cohesive, multi-faceted technology leadership professional development opportunities including, but not limited to LEADTECH, LA LEADS, Educational Leader Induction, and Tech Tools for Administrators" (LDE, 2007, p.1), many of which have been discontinued or left to districts to pursue independently.

LDE support for technology includes: Technology Assistance Teams (TAT), which advise the LDE in the needs of districts; Technology Planning, comprised of the provision of a Technology Plan Template to assist districts with the submission of their individual plans; state contracts, which provide cost-saving opportunities for districts to purchase technology; Infrastructure Design & Guidance, which is intended to assist districts with planning to meet the technology requirements for online statewide testing (LDE, 2007). The LDE "Technology Footprint Report" (LDE, 2014) recognized districts that met minimum recommended technology requirements in terms of a prescribed device-to-student ratio (currently 7:1) and the minimum network bandwidth capacity to facilitate statewide online testing. According to the latest Technology Footprint Report, "Louisiana now has 1,208 schools and 38 districts meeting minimum technology device standards" (LDE, 2014, p. 1); this is out of a total of 1303 public schools in 70 school districts.

LDE publishes academic school performance results by school, district, and statewide. Data is not compared by region; however, the researcher found significance in regional comparisons concerning perceptions of technology readiness. Regional comparisons may be useful in this case, because school districts within regions collaborate on professional development and all facets of training, including technology. Regional comparisons may also reveal industrial, cultural, and economic factors that may influence school perceptions of school readiness for effective technology implementation.

Chapter Summary

This chapter discussed the state of educational technological advancement in general, and, in particular, the Louisiana public education system. Transformational leadership was discussed as a model for school leaders to consider when implementing innovative and sustainable improvements to the educational environment concerning technology. Louisiana state-level educational leadership was discussed, and its current practices regarding technology were reviewed. The following chapter describes the methodological approach to this study.

CHAPTER 3 METHODOLOGY

Introduction

This chapter includes detailed information about the research design, a review of the research questions, and a description of the methodology used. The survey instrument, subject selection, data collection, and analysis are detailed. The purpose of this study was to identify Louisiana school leaders' perceived levels of preparation concerning technology implementation in their school programs. Based upon the review of relevant literature, a survey research design was deemed appropriate. Previous studies demonstrated that survey methodology can save time and financial expense, in addition to improving the researchers' abilities to collect and analyze data (Dillman, 2007). Dillman's strategies, 1. Respondent friendly questionnaire 2. Four contacts by first class mail, with an additional "special" contact 3. Return envelopes with real first class stamps 4. Personalization of correspondence, help to support the use of a survey in the present study. Data were collected and analyzed for both validity and reliability for each section of the survey instrument.

The Louisiana Department of Education (LDE, 2007) provides technology skill recommendations for Louisiana public school administrators based upon publications by the International Society for Technology in Education (ISTE). There exist, however, significant disparities between school leaders throughout the state. Much educational research has referred to the NETS-A standards for the purpose of creating surveys for their particular studies (Scanga, 2004; Seay, 2004). This study used the Principal Technology Leadership Assessment in its original form and in its entirety; the PTLA was developed by the University Council of Education Administrators (UCEA) Center for the Advanced Study of Technology Leadership in Education (CASTLE).

The PTLA was distributed to Louisiana public school administrators and was hosted on www.surveymonkey.com. Through this survey, public school administrators in Louisiana were asked to determine where they were in their self-reported knowledge and usage of technology. Additional regional and demographic items were added to provide further data relevant to the research aims of this study. This survey was based on NETS-A and was psychometrically validated by the American Institutes for Research (AIR).

Research Questions

This research was guided by the overarching question: What is the perceived technology leadership preparedness level of Louisiana public school leaders as measured by their responses to the 2009 ISTE NETS-A standards and are there significant differences in how Louisiana public school leaders self-report on NETS-A standards by BESE state region? The following sub-questions added clarity:

1. To what degree do Louisiana public school leaders perceive meeting the NETS-A standards? The standards are:
 - a. Leadership and Vision
 - b. Learning and Teaching
 - c. Productivity and Professional Practice
 - d. Support, Management, and Operations
 - e. Assessment and Evaluation
 - f. Social, Legal, and Ethical Issues (ISTE, 2002)
2. Are there significant differences in how Louisiana public school leaders self-report on NETS-A standards by state region?

Research Design

The researcher designed a quantitative study to determine the perceptions of Louisiana public school leaders concerning their technology leadership preparedness based upon their responses to the 2009 NETS-A. Because the researcher was determining perceptions rather than developing a theory, a quantitative study was required (Creswell, 2009). Based upon a review of research on technology standards for administrators, previous studies were found to be primarily quantitative non-experimental research (Creswell, 2009). The surveys for previous studies varied as did the populations sampled. Literature suggested that using surveys for this type of research design can be beneficial (Harlow, 2010). Advantages to using online surveys include streamlined access to data and decreased costs associated with the study (Fleming & Bowden, 2009).

Study Sample

Louisiana has approximately 1350 Louisiana public school leaders for 77 school systems in eight demographic regions throughout the state eligible to participate in this study (LDE, 2007). Almost all 1350 school leaders within the total population were contacted and invited to participate in the study. The response rate for research was calculated by the number of respondents divided by the number of eligible respondents (Fink, 2006). This study sample was comprised of 250 respondents (18%). Due to the potential of specific school characteristics being linked directly to participating administrators, only general demographic information is reported.

Instrumentation

The University Council for Educational Administration (UCEA) Center created the Principals' Technology Leadership Assessment (PTLA) for the Advanced Study of Technology Leadership in Education (CASTLE). The PTLA survey instrument was designed to help identify how school leaders utilize technology, what technology skills school leaders need, and what

technology skills the subjects currently have. By collecting regional data, comparisons can be made and analyzed to provide insights for future statewide technology efforts. The PTLA survey instrument met all of the researcher's needs to conduct this investigation and sufficiently answered the established research questions. Research for assessment development was funded by a grant from United States Department of Education (USDE) Fund for the Improvement of Postsecondary Education (Principals Technology Leadership Assessment, 2008). The PTLA is based upon the National Educational Technology Standards for Administrators (NETS-A) domains developed by the International Society for Technology in Education (ISTE) (Knezek, 2008).

The American Institutes for Research (AIR) conducted the survey validation. AIR conducted a pilot for the survey using 74 school leaders throughout seven U.S. states and Canadian providences. The reliability analysis resulted in Cronbach's alpha (α) = 0.95, indicating that the instrument was highly reliable. The highest individual reliability was in the area of Leadership and Vision (α =0.88). Item-test correlation analyses were conducted to identify relationships between each item and the overall instrument. Results indicated that the range of item-test correlations was $r = 0.39$ to 0.80 , with only seven items correlated less than 0.50 . The item-rest correlation indicated how each item was correlated with a scale computed from all other items, not including the item under consideration. For all items, this correlation is lower than the item-test correlation, which indicated that each item contributed significantly to overall measurement of the instrument construct. The values associated with 'Alpha if item removed' indicate that the PTLA would not benefit from the removal of individual items. (Development of the Instrument, 2008). Results of the current study were compared to the initial PTLA findings.

With items that are related a factor analysis was conducted (Green & Salkind, 2003) and reviewed for significant differences. These findings are discussed in the following chapters.

The PTLA contains 35 statements concerning the six domains of the NETS-performance indicators with five possible levels of leadership involvement ranging from low to high. Various experts in the fields of educational technology and school leadership reviewed the survey questions to ensure item validity. The expert reviews suggested evidence of face validity and provided the foundation for pilot testing and data analysis. For this study demographic questions were added to the PTLA survey questions to allow for frequency distributions and to provide a general description of the study population. The answers submitted to the survey were separated and excluded identifying information in order to protect participant confidentiality. Based upon previous research efforts, it was expected that there would have been a response return rate between 20 percent and 65 percent (Peterson, 2000; Scanga, 2004).

Data Collection

The researcher submitted the research proposal to the Louisiana State University (LSU) Institutional Review Board (IRB). The review board awarded approval for the research to be conducted. The researcher gathered school leaders email addresses from the Louisiana Department of Education, Division of Accountability, administrator database, which lists every building administrator in the state public school systems. Participants were contacted via electronic mail with a request to participate in the survey. A link to the survey was sent to the sample school leaders (see Appendix C). The researcher sent an additional request for participation seven days after the original request to increase responses.

The data were collected through www.surveymonkey.com. Survey Monkey is an automated survey program that facilitates creating and publishing surveys through their secure

server. Survey Monkey allows the data to be separated from identifying demographic information, thus keeping all responses confidential. Further analysis of the data transferred from Survey Monkey was conducted with IBM SPSS Statistics Desktop v.23.0 for MS Windows. The SPSS software allowed analysis of data.

The research questions were administered through an electronic web-based self-reported survey. The survey consisted of 35 questions corresponding to the six different areas of NETS-A. The answer selections for each question reflected five different levels of engagement (from low to high) in behaviors or usage of technology that related to school technology leadership. For each item, subjects were asked to select the statement, along a semantic scale, that best described their beliefs and practices. Additional demographic questions were asked to support a more detailed data analysis.

Data Analysis and Reporting

Using SPSS v23.0, data analysis was recorded in tables of descriptive statistics including frequency, mean, range, and standard deviation. The descriptive statistics were analyzed for anomalies such as empty survey responses. Further analysis using a one-way analysis of variance (ANOVA) was performed to reveal any subscale statistical significance. Results are displayed in a table followed by descriptive text.

Chapter Summary

The purpose of this study was to explore school leaders' perceptions of their technology leadership preparedness of school programs based upon the technology leadership skills defined by the 2009 NETS-A standards. The researcher conducted an investigative quantitative study to identify leaders' perceptions of technology leadership preparedness and determine mean levels

of perceived preparedness, ranges of variations from the mean, and regional correlations.

Respondents were school leaders in public schools in eight regions throughout Louisiana.

The researcher used descriptive and inferential statistics to convey the results of the study. Results indicated the extent to which public school leaders self-reported that they are prepared in the following areas of as they pertain to technology: Leadership and Vision; Learning and Teaching; Productivity and Professional Practice; Support, Management, and Operations; Assessment and Evaluation; and Social, Legal, and Ethical Issues. School leader feedback concerning perceived levels of technology preparedness data might be considered by stakeholders and decision makers seeking to strengthen and improve existing institutional structures. The results of this research study could also assist in the leadership preparation of Louisiana public school leaders and add additional research data to national studies. The study results and data analysis are explained in detail in Chapter 4.

CHAPTER 4

RESULTS AND ANALYSIS

Introduction

The purpose of this study was to identify perceptions of Louisiana school leaders concerning their levels of technology preparedness for school programs. School leaders representing all of the eight educational regions were invited to participate in an online survey. The instrument used for this study was the Principal's Technology Leadership Assessment (PTLA), designed to measure principal's technology leadership inclinations and activities over the course of the school year. The survey was administered online via Survey Monkey.

This research was guided by the overarching question: What is the perceived technology leadership preparedness level of Louisiana public school leaders as measured by their responses to the 2009 ISTE NETS-A standards and are there significant differences in how school leaders self-report on NETS-A standards by BESE state region? The following sub-questions added clarity:

1. To what degree do school leaders perceive meeting the NETS-A standards? The standards are:
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 - c. Productivity and Professional Practice
 - d. Support, Management, and Operations
 - e. Assessment and Evaluation
 - f. Social, Legal, and Ethical Issues (ISTE, 2002)
2. Are there significant differences in how school leaders self-report on NETS-A standards by state region?

This chapter presents results of the statistical analyses that were used to describe the respondents and sufficiently address the research questions. This chapter is divided into two sections; the first section uses descriptive statistics to explore the aggregate PTLA results, analyzed by categorical section, and the second section explores statistically-significant variations between regional groups, as identified by the One-Way ANOVA and Tukey HSD tests.

Approximately 1350 email invitations were sent to Louisiana public school leaders; of this number 250 responded and completed most or all of the survey questions online for a response rate of 18%.

Distribution of PTLA ratings over all 6 dimensions of the PTLA survey was used for the study of categorical variables. Each of these dimensions was addressed using frequency distributions, mean, and standard deviations (Table 1).

Table 1. Descriptive Statistics of 6 Dimensions of PLTA Survey

Dimension	Mean	SD	N
Visionary Leadership	3.46	0.31	250
Learning and Teaching	3.34	0.33	250
Productivity & Professional Practice	4.14	0.29	250
Support, Management, & Operations	3.4	0.32	250
Assessment & Evaluation	3.33	0.39	250
Social, Legal, & Ethical Issues	3.18	0.39	250

The means for the dimensions Learning and Teaching (3.34), Assessment & Evaluation (3.33), and Social, Legal, & Ethical Issues (3.18) suggested a generally modest belief in skill, knowledge, and ability somewhat in these dimensions. The means for Visionary Leadership (3.46) and Support, Management, & Operations (3.40) are slightly stronger, concerning behaviors and beliefs, although both means indicate a firm “Somewhat” according to the PTLA.

The category Productivity & Professional Practice, with a mean of (4.14), stands alone in the affirmative, indicating a “Significantly” on the scale. Analysis of questions and responses within each category follows in this chapter.

Leadership and Vision

The first category for analysis was Leadership and Vision. This category was comprised of the following questions:

Question 1: To what extent did you participate in your district's or school's most recent technology planning process?

Question 2: To what extent did you communicate information about your district's or school's technology planning and implementation efforts to your school's stakeholders?

Question 3: To what extent did you promote participation of your school's stakeholders in the technology planning process of your school or district?

Question 4: To what extent did you compare and align your district or school technology plan with other plans including district strategic plans, your school improvement plan, or other instructional plans?

Question 5: To what extent did you advocate for inclusion of research-based technology practices in your school improvement plan?

Question 6: To what extent did you engage in activities to identify best practices in the use of technology (e.g. reviews of literature, attendance at relevant conferences, or meetings of professional organizations)?

Mean results by Region are indicated in Figure 1.

As seen in Figure 1, the category mean (3.46) “Somewhat” is supported by a uniform distribution between 7 of the 8 regions. Region 2 respondents reported being “Significantly” in

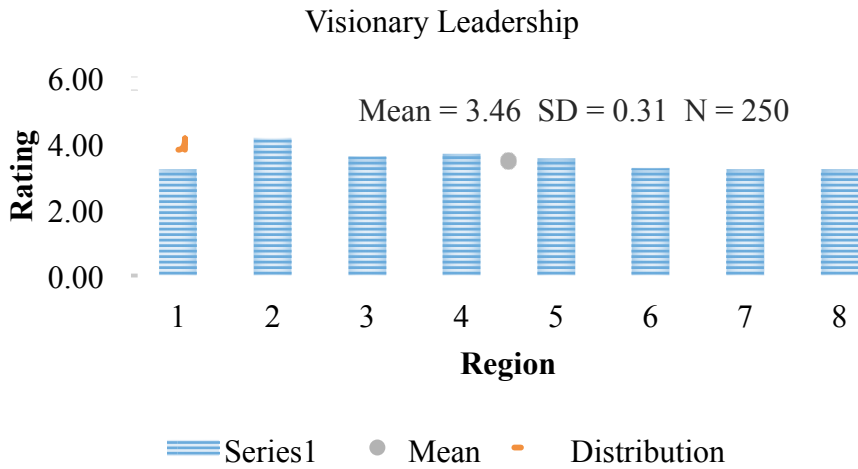


Figure 1. Visionary Leadership - Distribution and Mean

the affirmative regarding their leadership involvement with technology. Aggregate response means for each categorical question are reported in Table 2.

Table 2 represents the total number of each response 1 through 5 for each of the questions from the Leadership and Vision category. This category overall had an overall mean of (3.14)

					Mean	Total
1. To what extent did you participate in your district's or school's most recent technology planning process?					3.54	250
2. To what extent did you communicate information about your district's or school's technology planning and implementation efforts to your school's stakeholders?					3.33	250
3. To what extent did you promote participation of your school's stakeholders in the technology planning process of your school or district?					3.45	250
4. To what extent did you compare and align your district or school technology plan with other plans including district strategic plans, your school improvement plan, or other instructional plans?					3.54	250
5. To what extent did you advocate for inclusion of research-based technology practices in your school improvement plan?					3.08	250
Standard Deviation	Sample Variance	Kurtosis	Skewness	Confidence Level (95.0%)		
0.31	0.03	0.08	-0.85	0.19		

and standard deviation of (0.31). Responses to all questions in this category were consistent, indicating that “Somewhat” was a strong indication of the level of preparation, support, and

involvement concerning school leadership in the area of technology. Figure 2 illustrates that the largest response among participants for all questions was “Somewhat” and that the distribution of responses was within the less-affirmative range.

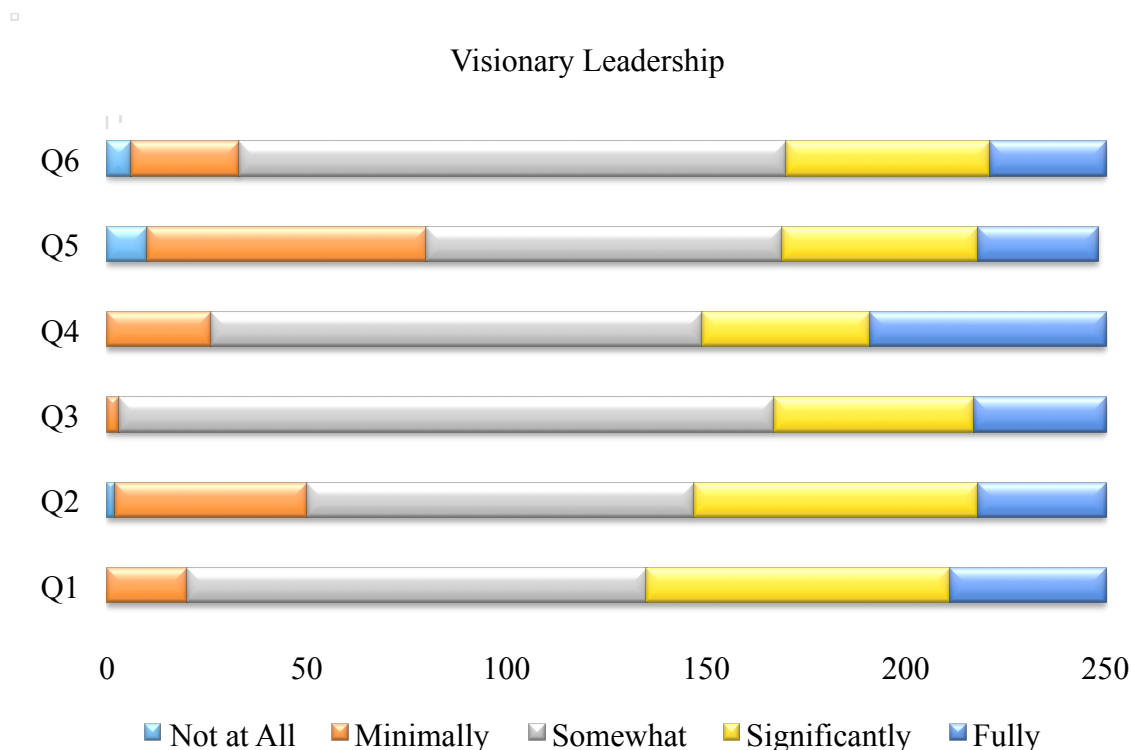


Figure 2. Visionary Leadership – Item Response Distribution

Learning and Teaching

Section 2, Learning and Teaching, concerned proactive behaviors on part of the school leaders to promote and support effective technology practices among faculty and staff.

Questions for this section included:

Question 7: To what extent did you provide or make available assistance to teachers to use technology for interpreting and analyzing student assessment data?

Question 8: To what extent did you provide or make available assistance to teachers for using student assessment data to modify instruction?

Question 9: To what extent do you disseminate or model best practices in learning and teaching with technology to faculty and staff?

Question 10: To what extent did you provide support (e.g. release time, budget allowance) to teachers or staff who are attempting to share information about technology practices issues and concerns?

Question 11: To what extent did you organize or conduct assessments of staff needs related to professional development on the use of technology?

Question 12: To what extent did you facilitate or ensure the delivery of professional development on the use of technology to faculty and staff charge learning and teaching responses for each question?

Mean results by Region are indicated in Figure 3.

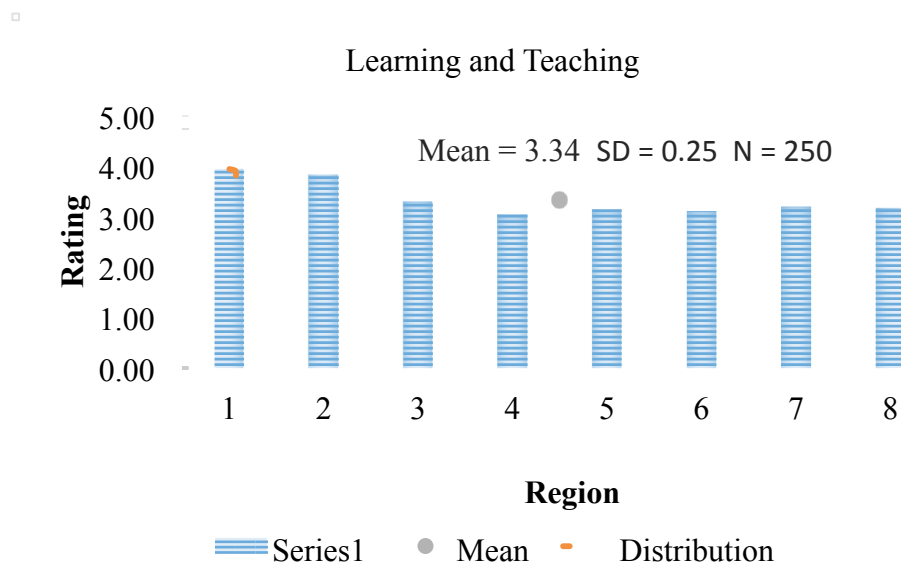


Figure 3. Learning and Teaching- Distribution and Mean

As with Visionary Leadership, responses to Learning and Teaching were firmly rooted in the “Somewhat” range. Variation was relatively low among responses, although regions 1 and 2

both attained the affirmative status of “Significantly.” Region 2, with a mean of (3.83), was affirmative in two categories, suggesting a potentially statistically meaningful difference between itself and the other regions throughout the state.

Table 3 indicated that the lowest overall responses in the category were in the areas of modeling effective technology practices and providing professional development for faculty and staff. This had meaningful implications that will be discussed in the following chapter. The highest affirmative response was concerning the provision of assistance to teachers with technology-aided student assessment. Although this response was the highest in this category, the mean (3.41) was merely “Somewhat.” A Kurtosis of (-1.28) indicated a left-skewed distribution, further illustrated in Figure 4.

Table 3. Descriptive Statistics of Learning and Teaching				Mean	Total
7. To what extent did you provide or make available assistance to teachers to use technology for interpreting and analyzing student assessment data?				3.41	250
8. To what extent did you provide or make available assistance to teachers for using student assessment data to modify instruction?				3.28	250
9. To what extent did you disseminate or model best practice in learning and teaching with technology to faculty and staff?				2.99	250
10. To what extent did you provide support (e.g. release time, budget allowance) to teachers or staff who were attempting to share information about technology practices, issues, and concerns?				3.31	250
11. To what extent did you organize or conduct assessments of staff needs related to professional development on the use of technology?				3.1	250
12. To what extent did you facilitate or ensure the delivery of professional development on the use of technology to faculty and staff?				2.84	250
Standard Deviation	Sample Variance	Kurtosis	Skewness	Confidence Level (95.0%)	
0.33	0.05	-1.28	-0.37	0.23	

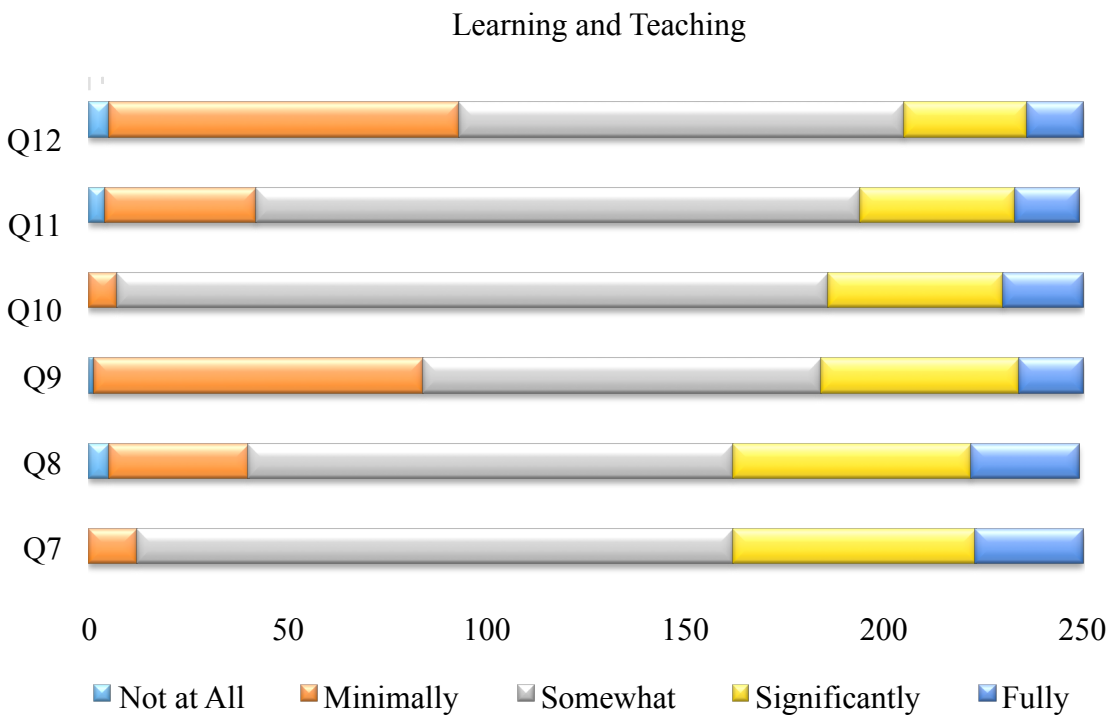


Figure 4. Learning and Teaching Item Response Distribution

Productivity & Professional Practice

The category Productivity and Professional Practice shifted from behaviors to support others in their use of technology to that of school leader utilization of technology for improved administrative effectiveness. This category included the following questions:

13. To what extent did you participate in professional development activities meant to improve or expand your use of technology?

14. To what extent did you use technology to help complete your day-to-day tasks (e.g., developing budgets, communicating with others, gathering information)?

15. To what extent did you use technology-based management systems to access staff/faculty personnel records?

16. To what extent did you use technology- based management systems to access student records?

17. To what extent did you encourage and use technology (e.g., email, blogs, video conferences) as a means of communicating with education stakeholders, including peers, experts, students, parents/guardians, and the community?

Mean results by region are indicated in Figure 5.

As can be seen in Figure 5, the mean rating of (4.14) was a divergence from “Somewhat” range into “Significantly.” The standard deviation (0.29) was relatively low, indicating consistency among regions concerning this category. Each of the eight regions rated “Significantly” concerning Productivity and Professional Practice. This suggested efficacy in the use of technology, particularly as a tool for personal utilization in the role of school administrator and leader. The apparent discrepancies between the effective use of technology for professional applications and the use of technology for instructional applications will be discussed in the following chapter. Region 2 with a mean rating of (4.73) stood out with a rating of “Fully,” the only instance of such a rating thus far.

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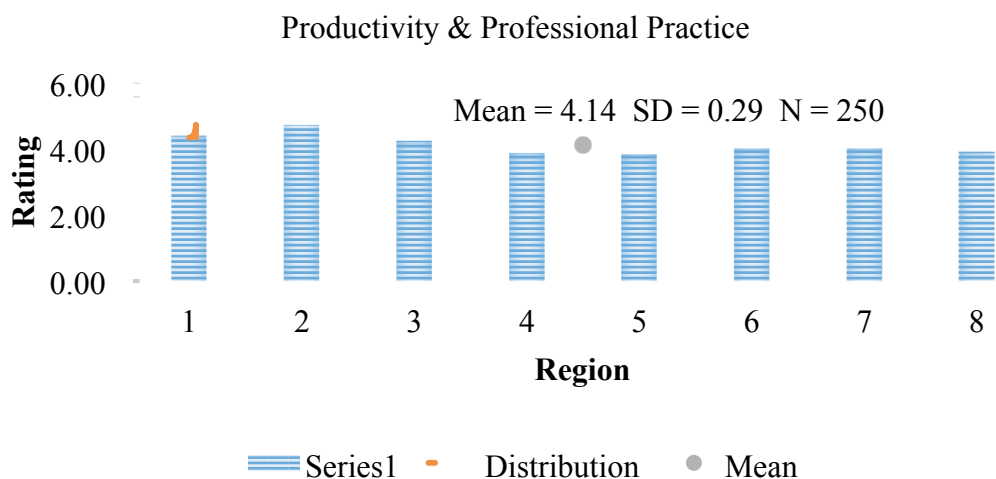


Figure 5. Productivity and Practice Distribution and Mean

Table 4 analyses the category by question. There was greater variance in this category than those preceding it. Most notably was the difference in rating between Question 13

(mean=3.2), which concerned participation in technology professional development, and Question 16 (mean=4.81), which involved the use of technology to access student records. As both professional development opportunities and electronic student database software may be subject to district-level governance, this may illuminate a statewide practice of districts providing technology for use without commensurate provisions of opportunities for technology-focused professional development. Figure 6 illustrates that the vast majority of responses to Question 16 were the highest level of engagement “Fully.”

Table 4. Descriptive Statistics of Productivity & Professional Practice					Mean	Total
13. To what extent did you participate in professional development activities meant to improve or expand your use of technology?					3.2	250
14. To what extent did you use technology to help complete your day-to-day tasks (e.g., developing budgets, communicating with others, gathering information)?					3.62	250
15. To what extent did you use technology-based management systems to access staff/faculty personnel records?					4.5	250
16. To what extent did you use technology- based management systems to access student records?					4.81	250
17. To what extent did you encourage and use technology (e.g., email, blogs, video conferences) as a means of communicating with education stakeholders, including peers, experts, students, parents/guardians, and the community?					4.06	250
Standard Deviation	Sample Variance	Kurtosis	Skewness	Confidence Level (95.0%)		
0.29	0.42	-1.53	-0.14	0.81		

Support, Management, & Operations

The category Support, Management, & Operations concerned the seeking, acquisition, and maintenance of school wide technology by the school leader. Questions in this category included:

18. Do you support faculty and staff in connecting to and using district- and building-level technology systems for management and operations (e.g., student information system, electronic grade book, curriculum management system)?

19. To what extent did you allocate campus discretionary funds to help meet the school's technology needs?

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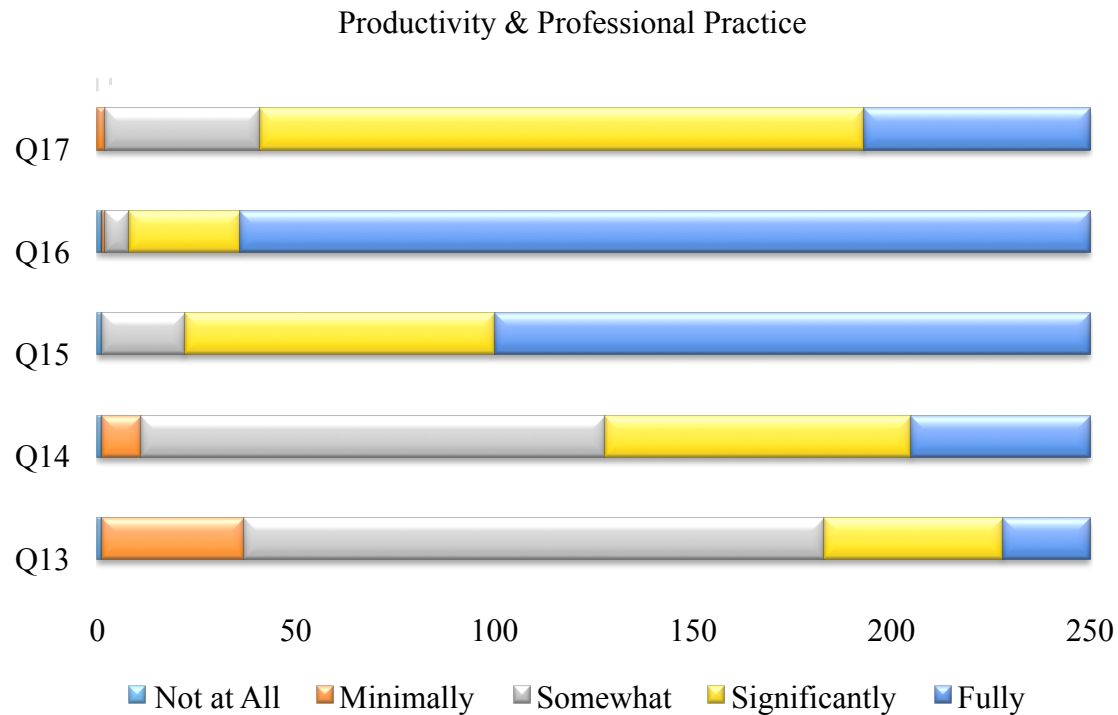


Figure 6. Productivity & Professional Practice Item Response Distribution

20. To what extent did you pursue supplemental funding to help meet the technology needs of your school?

21. To what extent did you ensure that hardware and software replacement/upgrades were incorporated into school technology plans?

22. To what extent did you advocate at the district level for adequate, timely, and high-quality technology support services?

23. To what extent did you investigate how satisfied faculty and staff were with the technology support services provided by your district/school?

Mean results by region are indicated in Figure 7.

With an overall mean of (3.40), Figure 7 illustrated a return to the rating, “Somewhat.” Variation was not high, which demonstrated consistency among responses. Noteworthy was Region 2, rating, “Significantly”.

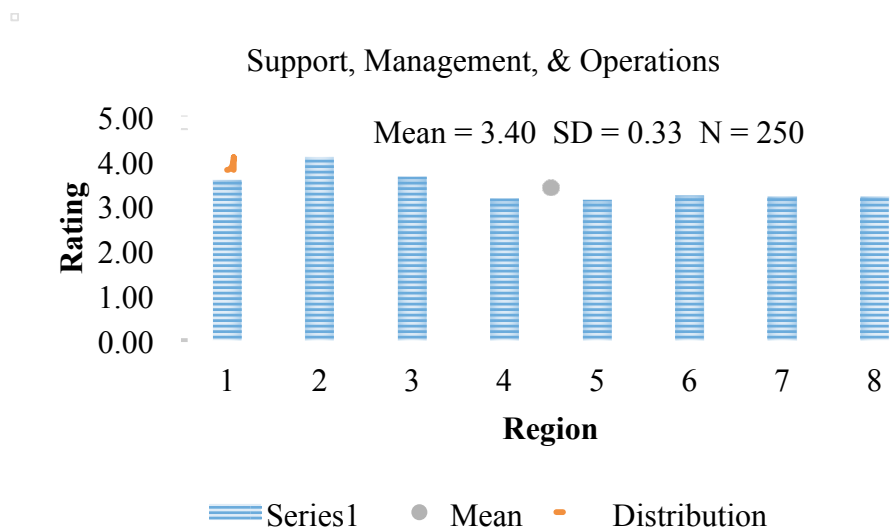


Figure 7. Support, Management, & Operations –Distribution & Mean

Table 5 analyses the category by question. All questions were rated in the “Somewhat” range, with the slight exception of Question 22 (mean=2.84). This question concerned advocating for high-quality technology support at the district level. The lower-than-average rating could suggest a variety of realities throughout the state. Analysis by region (Figure 7) may suggest that some districts were more conducive to district-level advocacy than others. This topic will be discussed in the following chapter.

Figure 8 illustrated a central tendency toward the median, with a slight skew to the left. Question 18 had the most affirmative responses; this question concerned school leader support for faculty and staff use of technology for administrative functions. This contrasted with the lower ratings for support with instructional technology utilization.

Table 5. Descriptive Statistics: Support, Management, & Operations

Questions	Mean	Total
18. Support faculty and staff in connecting to and using district- and building-level technology systems for management and operations (e.g., student information system, electronic grade book, curricular management system)?	3.51	250
19. To what extent did you allocate campus discretionary funds to help meet the school's technology needs?	3.53	250
20. To what extent did you pursue supplemental funding to help meet the technology needs of your school?	3.38	250
21. To what extent did you ensure that hardware and software replacement/upgrades were incorporated into school technology plans?	3.44	250
22. To what extent did you advocate at the district level for adequate, timely, and high-quality technology support services?	2.84	250
23. To what extent did you investigate how satisfied faculty and staff were with the technology support services provided by your district/school?	3.04	250
Standard Deviation	Sample Variance	Kurtosis
0.32	0.08	-0.78
	Skewness	Confidence Level (95.0%)
	-1.02	0.30



Figure 8. Support, Management, & Operations Item Response Distribution

Assessment & Evaluation

Assessment & Evaluation explored the concept of incorporating technology into programs of assessment. This ranged from using technology as an assessment tool to assessing technology and technology implementation. Questions from this category included:

24. To what extent did you promote or model technology-based systems to collect student assessment data?
25. To what extent did you promote the evaluation of instructional practices, including technology-based practices, to assess their effectiveness?
26. To what extent did you assess and evaluate existing technology-based administrative and operations systems for modification or upgrade?
27. To what extent did you evaluate the effectiveness of professional development offerings in your school to meet the needs of teachers and their use of technology?
28. To what extent did you include the effective use of technology as a criterion for assessing the performance of faculty?

Mean results by region are indicated in Figure 9.

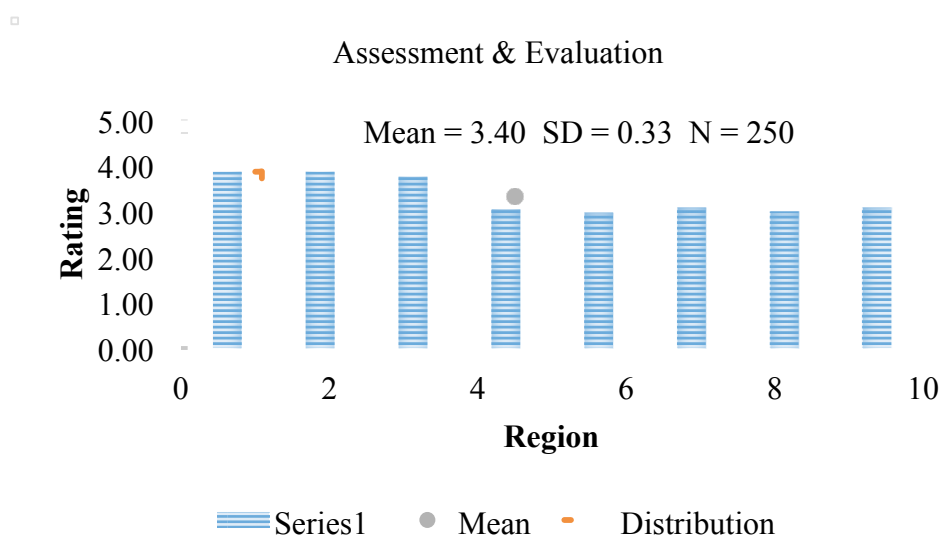


Figure 9. Assessment & Evaluation Distribution and Mean

Figure 9 illustrated a clear differentiation among regions. Although the differences in means were not particularly large, there appeared to be a distinction between districts that assertively agreed that there was current implementation of evaluation around technology and those districts that appeared to be tentative. An explication of responses to individual questions may reveal potential causes for such a clear delineation.

Table 6 did not reveal an outlier that would explain a distinction between regions that rated “Significantly” and those that rated “Somewhat.”

Table 6. Descriptive Statistics of Productivity & Assessment and Evaluation					Mean	Total
24. To what extent did you promote or model technology-based systems to collect student assessment data?					3.07	250
25. To what extent did you promote the evaluation of instructional practices, including technology-based practices, to assess their effectiveness?					2.98	250
26. To what extent did you assess and evaluate existing technology-based administrative and operations systems for modification or upgrade?					3.48	250
27. To what extent did you evaluate the effectiveness of professional development offerings in your school to meet the needs of teachers and their use of technology?					3.08	250
28. To what extent did you include the effective use of technology as a criterion for assessing the performance of faculty?					3.28	250
Standard Deviation	Sample Variance	Kurtosis	Skewness	Confidence Level (95.0%)		
0.39	0.04	-0.19	0.94	(95.0%)		

It may be noted that the categorical distinctions are not particularly large; the four regions that indicated “Somewhat” were not distant from the “Significantly” rating, and vice versa. The results revealed a pattern that, although interesting, was not necessarily statistically significant. Figure 10 revealed a strong central tendency, skewed right. Overall, the ratings for this category suggested affirmative perceptions with regard to the inclusion of technology into programs of assessment and evaluation.

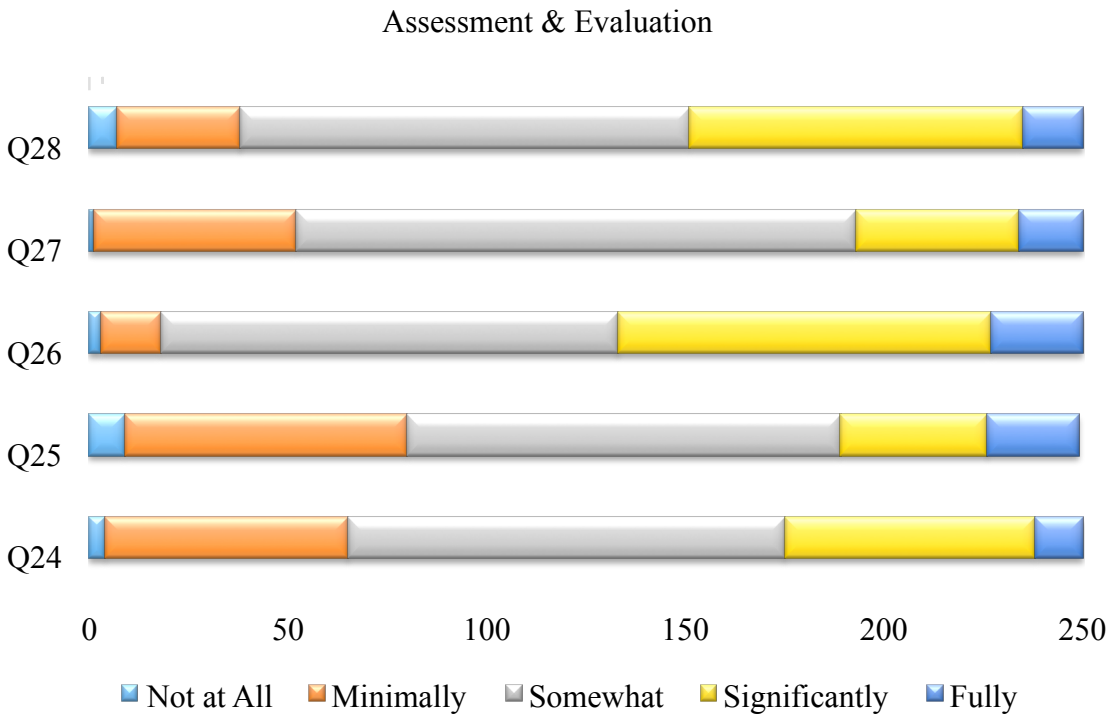


Figure 10. Assessment & Evaluation Item Response Analysis

Social, Legal, & Ethical Issues

This category, Social, Legal, & Ethical Issues, explored the school leader’s active involvement in the legal use of technology in addition to the advocacy of fair and equitable access to technology. Questions in this category included:

29. To what extent did you work to ensure equity of technology access and use in your school?

30. To what extent did you implement policies or programs meant to raise awareness of technology-related social, ethical, and legal issues for staff and students?

31. To what extent were you involved in enforcing policies related to copyright and intellectual property?

32. To what extent were you involved in addressing issues related to privacy and online safety?

33. To what extent did you support the use of technology to help meet the needs of special education students?

34. To what extent did you support the use of technology to assist in the delivery of individualized education programs for all students?

35. To what extent did you disseminate information about health concerns related to technology and computer usage in classrooms and offices?

Figure 11 revealed a distinction between regions that responded affirmatively and those that were more tentative in their ratings of the questions. As with the category of Assessment and Evaluation, Region 1 (mean=3.67), Region 2 (mean=3.81), and Region 3 (mean=3.46) answered more affirmatively than Regions 4-8. The aggregate mean indicated that school leaders throughout the state “Somewhat” practice the technology-based behaviors described in this section.

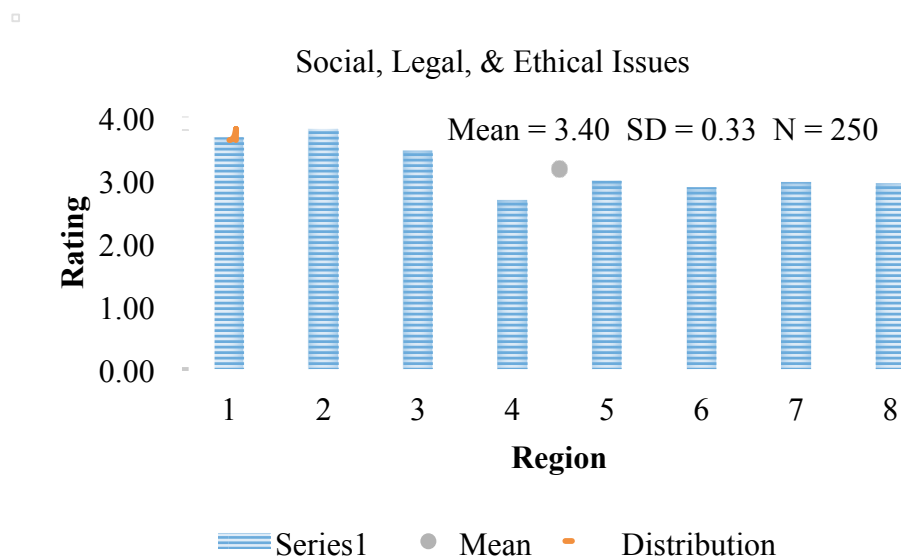


Figure 11. Social, Legal, & Ethical Issues

Table 7 revealed higher variation in this category than the other 5 categories. The lowest rating was on Question 35 (mean=1.76), which concerned the dissemination of information about

Table 7. Descriptive Statistics of Social, Legal, & Ethical Issues					Mean	Total
29. To what extent did you work to ensure equity of technology access and use in your school?					3.61	250
30. To what extent did you implement policies or programs meant to raise awareness of technology-related social, ethical, and legal issues for staff and students?					2.51	250
31. To what extent were you involved in enforcing policies related to copyright and intellectual property?					2.48	250
32. To what extent were you involved in addressing issues related to privacy and online safety?					3.48	250
33. To what extent did you support the use of technology to help meet the needs of special education students?					4.04	250
34. To what extent did you support the use of technology to assist in the delivery of individualized education programs for all students?					3.4	250
35. To what extent did you disseminate information about health concerns related to technology and computer usage in classrooms and offices?					1.76	250
Standard Deviation	Sample Variance	Kurtosis	Skewness	Confidence Level (95.0%)		
0.39	0.65	-0.94	-0.49	(95.0%)		

technology-related health concerns. Responses to this question indicated that the majority of survey participants did not participate in such information dissemination at all. The highest rated question involved support for the use of technology for the benefit of Special Populations within their schools. The remaining questions ranged narrowly between “Minimally” and “Somewhat.” Figure 12 illustrates responses by category.

Figure 12 revealed wide variation among responses. This may indicate either a lack of information concerning social, legal, and ethical issues involving technology, or a lack of direction concerning the role of school leaders in the advocacy of these topics.

Data from the descriptive statistics suggested that there was a statistically significant difference between at least one of the groups and another. A One-Way ANOVA-Single Factor test was conducted to verify this possibility.

□

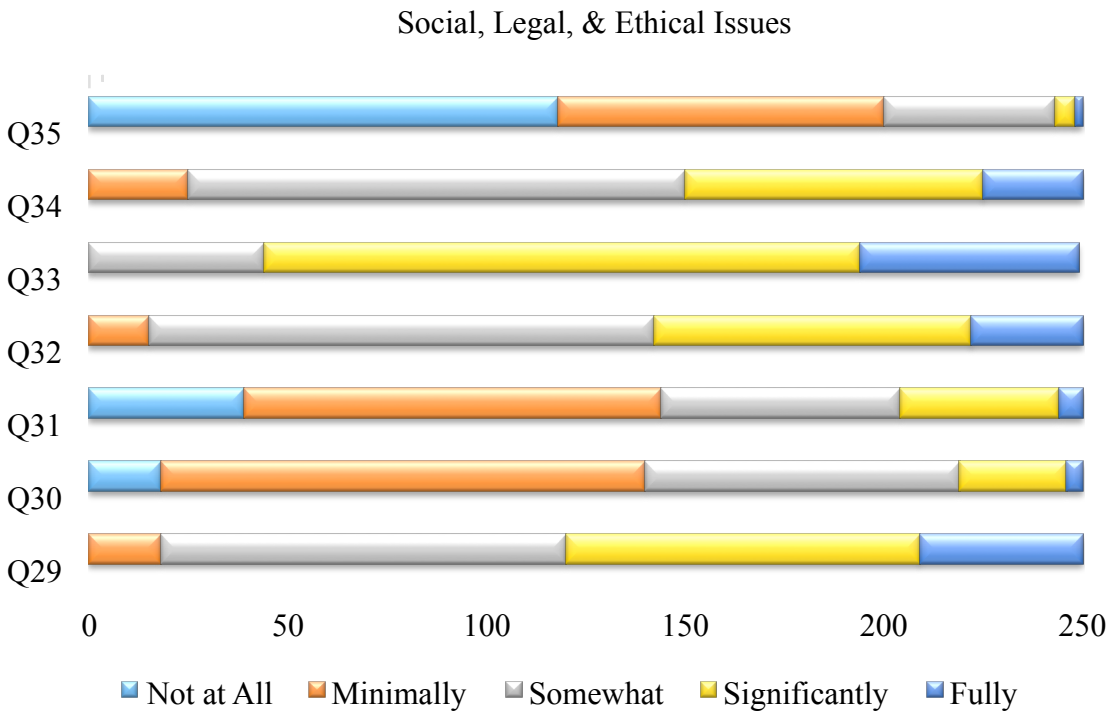


Figure 12. Social, Legal, & Ethical Issues – Item Response Analysis

ANOVA-Single Factor

The summary statistics and results of the ANOVA-Single Factor analysis are delineated in Table 8 and Table 9, respectively.

Assumptions.

1. Independence of cases.
2. Normality – the distributions of the residuals are normal.
3. Homogeneity of variances.

Conclusion from ANOVA.

The p-value corresponding to the F-statistic of one-way ANOVA ($F(7,40) = 4.415, p = 0.0010351$) is lower than 0.05, suggesting that the one or more means were significantly different. The Tukey HSD test follows with the results illustrated in Table 10. This post-hoc test identified which of the pairs of group means were significantly different from each other.

Table 8. Summary Statistics – ANOVA: Single Factor

Groups	Count	Sum	Average	Variance
Region 1	6	22.64954	3.77492395	0.163368952
Region 2	6	24.46508	4.07751323	0.121959856
Region 3	6	22.00251	3.66708554	0.106029131
Region 4	6	19.44583	3.24097222	0.194394869
Region 5	6	19.58326	3.26387686	0.121430474
Region 6	6	19.56328	3.2605472	0.157407996
Region 7	6	19.56122	3.26020259	0.152213123
Region 8	6	19.51147	3.25191154	0.118683279

Table 9. ANOVA Results

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4.386664	7	0.62666631	4.415134178	0.0010351	2.249024325
Within Groups	5.677438	40	0.14193596			
Total	10.0641	47				

Tukey HSD Test

Results of the Tukey HSD confirmed a statistically significant difference between the means of one or more groups. Group “B” corresponds to Region 2, which differed from other regions in the majority of PTLA categories. As indicated before, Region 2 had similar results to Region 1 and Region 3 in certain categories, and no statistically significant difference was indicated between these 3 groups. It is interesting to note the geographical commonality among these 3 groups. Also noteworthy is that neither Region 1 nor Region 2 differed significantly, despite similarities to Region 2. Possible explanations will be discussed in the following chapter.

Table 10. Tukey HSD Results

Pair	Q statistic	p-value	Inference
A vs B	1.957	0.844081	insignificant
A vs C	0.7028	0.899995	insignificant
A vs D	3.4707	0.244357	insignificant
A vs E	3.3085	0.298695	insignificant
A vs F	3.3301	0.291091	insignificant
A vs G	3.3301	0.291091	insignificant
A vs H	3.3842	0.272527	insignificant
B vs C	2.6598	0.562453	insignificant
B vs D	5.4276	0.009322	** p<0.01
B vs E	5.2655	0.012791	* p<0.05
B vs F	5.2871	0.012268	* p<0.05
B vs G	5.2871	0.012268	* p<0.05
B vs H	5.3411	0.011046	* p<0.05
C vs D	2.7679	0.519125	insignificant
C vs E	2.6057	0.584119	insignificant
C vs F	2.6273	0.575453	insignificant
C vs G	2.6273	0.575453	insignificant
C vs H	2.6814	0.55379	insignificant
D vs E	0.1622	0.899995	insignificant
D vs F	0.1406	0.899995	insignificant
D vs G	0.1406	0.899995	insignificant
D vs H	0.0865	0.899995	insignificant
E vs F	0.0216	0.899995	insignificant
E vs G	0.0216	0.899995	insignificant
E vs H	0.0757	0.899995	insignificant
F vs G	0	0.899995	insignificant
F vs H	0.0541	0.899995	insignificant
G vs H	0.0541	0.899995	insignificant

Chapter Summary

This study was conducted to identify Louisiana school leaders' perceptions of technology preparedness. Data were collected online using the PTLA Survey Instrument. The researcher analyzed the data using descriptive statistics, One-Way ANOVA, and Tukey HSD. Statistically significant differences were found between the means of one group and five other groups. These differences will be explored and discussed in the following chapter.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

Overview of Study

The purpose of this study was to determine the perceptions Louisiana school leaders have of their technology leadership preparedness based on the 2014 ISTE Standards for Administrators. Due to a lack of conclusive research on the topic, the current state of principal preparedness for implementation of technology was not clearly defined. Principal preparation programs vary over time, suggesting an inherent difference in training between veteran principals and those new to the school administration (McQuiggan, 2007). State support may be useful for providing guidelines, however, such guidelines are not tools for principal training in the implementation of technology and all that it encompasses. Independent organizations, such as ISTE, do provide training opportunities, however, principal participation in such training is strictly voluntary and often costly in terms of time and financial resources (ISTE, 2014). It is not clear where principals gain the knowledge or skills specific to technology and how to specifically implement technology at their schools. This study sought to provide insight into the current condition of Louisiana school leaders readiness to implement technology and to share school leader insights into what may help to advance their levels of preparation. The purpose of this quantitative, descriptive study was to gain perspective Louisiana public school leaders' perceptions of their levels of preparedness to effectively integrate technology into their schools as a major component of their educational program.

Research Questions

This research was guided by the overarching question: What is the perceived technology leadership preparedness level of Louisiana public school leaders as measured by their responses to the 2009 ISTE NETS-A standards and are there significant differences in how school leaders

self-report on NETS-A standards by BESE state region? The following sub-questions added clarity:

1. To what degree do school leaders perceive meeting the NETS-A standards? The standards are:
 - a. Leadership and Vision
 - b. Learning and Teaching
 - c. Productivity and Professional Practice
 - d. Support, Management, and Operations
 - e. Assessment and Evaluation
 - f. Social, Legal, and Ethical Issues (ISTE, 2002)
2. Are there significant differences in how school leaders self-report on NETS-A standards by state region?

Study Sample

Louisiana has approximately 1350 high school leaders for 77 school systems in 8 demographic regions throughout the state eligible to participate in this study (LDE, 2007). Most of the 1350 school leaders within the total population were contacted and invited to participate in the study. The response rate for research was calculated by the number of respondents divided by the number of eligible respondents (Fink, 2006). Due to the potential of specific school characteristics being linked directly to participating administrators, only general demographic information was reported.

Summary of Findings

This study found that Louisiana school leaders rated themselves marginally proficient in each of the six categories of technology leadership, according to the PTLA. Aggregate response

ratings were highest in Professional Practice with mean score (4.14) reaching the level “Significantly” proficient. Overall responses were lowest (mean=3.18) in the category Social, Legal, & Ethical Issues, scoring low within the “Somewhat” range. Responses in each of the remaining four categories were solidly and closely aligned within the “Somewhat” range. These findings suggested a presently unmet potential for technology leadership among Louisiana school leaders. Further analysis identified a statistically-significant difference in perceived levels of preparedness for technology leadership between school leaders in Region 2 and those in Regions 4-8. Discussion of aggregate scores within each of the six PTLA categories and significant between-group differences follows next in this chapter.

Discussion

Though limited in scope, this study provides useful data for research and public policy. The absence of research related to technology leadership among Louisiana school leaders leaves room for much scholarly inquiry, research, and investigation. The Louisiana Department of Education currently looks to guidance from ISTE, USDE, NCAET, and other largely recognized authorities for guidance regarding educational technology leadership. The PTLA was developed by NCAET in collaboration with USDE and nationally recognized authorities in the fields of education and technology, and is aligned with NETS-A educational technology leadership standards. Consistent with national and therefore state standards, respondents’ ratings suggested a generalized lack of capacity to implement effective technology leadership in schools throughout Louisiana. Considering the ever-expanding and innovative field of technology’s inability to maximize in the 21st century, or to even fully implement currently available technology, has the potential to hinder adaptation and mastery of emerging technologies. In short, the effects can be cumulative.

Visionary Leadership

Overall responses in the category Visionary Leadership indicated basic levels of proficiency and involvement in technology leadership concerning planning and advocacy. The highest rated item was participation in district technology planning process. The Louisiana Department of Education (LDE) requires all districts receiving federal education (Title I, Part A) funding to participate in a collaborative technology planning process, the results of which must be submitted by districts (LDE, 2007). LDE provides direct guidance and structured support for the district technology-planning process. Although somewhat lower within the same range, the lowest score involved advocacy for research-based technology practices within the school plan. Such advocacy involvement on any level may be in response to district-level response to such efforts from school-level leaders. It was apparent in this category that school leaders throughout the state had the skills and capacity to participate in visionary planning processes. Why levels of present involvement appeared to be at participatory rather than leading levels may involve critical factors outside the realm of school leader control.

Learning and Teaching

Results within the category Teaching and Learning were consistent with ratings of low to moderate levels of involvement, competence, and capacity concerning the provisions and support of technology training and planning among the faculty and staff. The highest rating involved facilitating teacher assistance with using technology for student assessment. The lowest rating concerned the facilitation of professional development for more generalized technology use among faculty and staff. This variation could be due to many factors. Because each of the other responses was closely aligned and within the middle range of the highest and lowest rated topics, the variation might be budgetary. Additionally, the low-scoring category indicated a nonspecific

use for technology and may present challenges to a school leader seeking to access or expend resources for professional development. Overall results suggested that there existed a uniform willingness on part of Louisiana school leaders to provide training and support for their faculties and staffs, within contextual constraints.

Productivity and Professional Practice

Ratings in the category Productivity and Professional Practice were higher than any other category and in the range of proficiency. Responses from all eight regions were high. The lowest ratings were in the area of participation in technology-based professional development. The most highly rated was use of technology-based data management systems to access both student and personnel records. As indicated in Chapter 4, school districts in all eight regions require schools to maintain student and employee data on electronic databases. Districts also report student, personnel, and other data electronically to the LDE with the assistance of such databases. The researcher noted that the LDE does not require districts to utilize a particular type or brand of software.

The reports of high technology use among school leaders throughout all eight regions for all segments of this category strongly indicated Louisiana school leader technology competency, at least in terms of personal technology use. Competent personal technology use, however, does not necessarily translated to effective use of instructional technology or technology leadership. The researcher recommends that resources and opportunities for technology training accompany requirements for technology use by school leaders.

Support, Management, & Operations

The category Support, Management, & Operations involved school leader acquisition, support, and maintenance of technology within the school environment. Ratings clustered around

the center of the scale, with an overall mean of (3.40), which indicated basic level of proficiency and involvement. At the high end of the scale were Regions 1, 2, and 3, and at the lower end of the scale were Regions 4-8. No individual question had a remarkably higher response than the others. School leaders uniformly appeared to be engaged in basic levels of technology acquisition and support. These ratings indicated that leaders from all eight regions appeared to be competent in these areas, with potential to achieve more if given greater capacity.

One question that was rated conspicuously low was the item that referred to advocacy at the district level for high-quality technology support services. In schools where technology use was required, substantial technology support services would also be required. The low indications of school leader advocacy for quality services from their districts suggested that either districts throughout Louisiana provide exemplary technology support services to schools, or that school leaders throughout Louisiana were not greatly encouraged to participate in such types of advocacy.

Assessment & Evaluation

The category Assessment and Evaluation involved the use of technology as a tool for evaluation of students and faculty, in addition to the evaluation of technology being utilized. Responses were categorically similar, hovering around the mean (3.33). School leaders from all regions indicated basic levels of comfort, competence, and current involvement with the evaluation of technology resources and the use of technology as a tool for evaluation. Noteworthy was the delineation between regions reporting basic levels of competency and those reporting more advanced levels of competency. As in the category Support, Management, & Operations, Regions 1, 2, and 3 stood conspicuously above the other five regions. It is possible that there is regional cooperation or collaboration around technology among those

geographically-close regions. Further research and investigation into the presences of regional collaboration around technology use and leadership might prove valuable to the study of school technology leadership.

Social, Legal, & Ethical Issues

The final category, Social, Legal, & Ethical Issues, encompassed enforcement of policies and provisions for equitable access to the use and benefits of technology within the school. The lowest rated item with a mean of (2.48) in the “Minimally” range involved enforcement of policies related to copyright and intellectual property. This is an understandably complex technological area, particularly concerning enforcement. A low rating on this item was consistent with the overall picture of school leader technological capacity. Similarly, low rated was an item that concerned implementation of policies or programs to raise awareness of various technology issues and concerns for students and faculty. The mean response for this item (mean=2.51) fell in the classification “Minimally.” Further item analysis of this question revealed a notable number of responses within the “Not at All” category. The highest rated item concerned supporting the use of technology to help meet the needs of special education students. Respondents affirmed both willingness and ability to support special populations with technology.

Regional Variation

This study sought to identify statistically-significant regional differences in perceived levels of technology preparedness and competence among Louisiana school leaders. Consistent with researcher expectations, statistically significant region distinctions did exist. Contrary to researcher expectation, this was due to only one outstanding region. Seven of the eight Louisiana regions were remarkably similar in all six categories, also concerning the vast majority of items. This lack of variation has substantial implications for future research and policy. Additionally,

Region 2 exceeded all other districts in its perceptions of readiness and involvement with technology leadership. Regions 1 and 3 were comparable and there was not a statistically-significant difference. The strongest variation in this study was between Region 2 and Region 4. The researcher found this distinction noteworthy.

A map of Louisiana showing its 64 parishes, color-coded into eight regions and numbered 1 through 8. The regions are: 1 (yellow, northeast), 2 (yellow, east-central), 3 (purple, south-central), 4 (cyan, south-central), 5 (pink, southwest), 6 (green, central), 7 (blue, northwest), and 8 (light blue, north-central). The parishes are labeled with their names: Bossier, Webster, Claiborne, Union, Morehouse, West Carroll, East Carroll, Caddo, Lincoln, Ouachita, Richland, Madison, Bienville, Jackson, Caldwell, Franklin, Tensas, De Soto, Red River, Winn, Grant, La Salle, Catahoula, Concordia, Sabine, Natchitoches, Rapides, Avoyelles, Vernon, St. Landry, West Feliciana, East Feliciana, St. Helena, Tangipahoa, Washington, St. Tammany, Orleans, St. Bernard, Plaquemines, Terrebonne, Lafourche, St. Charles, St. John, St. James, Iberville, Ascension, St. Martin, St. Mary, Vermilion, Iberia, Calcasieu, Jeff. Davis, Allen, Evangeline, Acadia, Lafayette, St. Louis, and Cameron.

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there is not sufficient data in this study to make assumptions about the disparity between these regions. This may be useful to investigate in future research on school technology leadership in Louisiana.

The data suggested that school leaders in all eight Louisiana regions perceived themselves to have at least basic competence and involvement in school technology leadership, according to the PTLA. Perceptions of technology leadership among Louisiana school leaders was consistent, the only outlier being a region rating significantly higher than the others, with none producing particularly-low results. There was some evidence to suggest possible collaboration among geographically-close regions, to the benefit of school leaders. An adjoining region with significantly different results confounded this, however.

Limitations and Delimitations

The Louisiana school leaders who completed the survey might not have been representative of all Louisiana school leaders. The school leaders responding to the survey might be more technologically proficient than those who did not respond. The sample groups were not randomized and might not be reliable.

Recommendations

School districts throughout every region of Louisiana have access to 21st century technology in all of its major forms. This places students in the position to access the same information, tools, and resources available to students everywhere else in the American public school system. For Louisiana students to most greatly benefit from this opportunity, teachers must be technologically proficient along instructional, evaluative, and productive dimensions. In turn, teachers rely upon school leaders to create structures conducive to technology access, support, and training.

Results of this study suggested that Louisiana school leaders in every region of the state believed that they are adequately proficient to provide higher-than-basic levels of technology leadership. The school leaders might require additional support from district and state educational leadership to move beyond current levels of implementation. The researcher recommends that policy makers at the district and state level investigate ways in which school leaders can best be trained in technology leadership, and how regions can collaborate in ways that build efficacy in school leaders concerning technology.

Recommendations for Research

Results of this study revealed many other questions, the answers to which may help to increase and improve technology leadership in Louisiana schools. An investigation, for example, into the high perceptions of technology leadership in Region 2 and its geographical neighbors, Regions 1 and 3, may reveal practices that could benefit the other state regions. An investigation into the low levels of school leader advocacy within their school districts may bring to light factors that hinder such potentially-beneficial actions on part of Louisiana school leaders.

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APPENDIX A

ONLINE SURVEY CONSENT FORM

You are being invited to participate in a research study titled “**Louisiana School Leaders’ Perceptions of K-12 Online Technology Readiness** *Louisiana School Principals’ Perceptions of K-12 Online Education Readiness*”. This study is being done by **Jeffery Hand, Ph.D. Candidate** from the Louisiana State University, Baton Rouge. You were selected to participate in this study because you are the principal school leader of a k-12 public school in Louisiana.

The purpose of this research study is to determine principal school leader perceptions of k-12 school readiness to implement technology. If you agree to take part in this study, you will be asked to complete an online survey/questionnaire. This survey/questionnaire will ask about your perceptions of readiness to implement technology into your instructional program, along a variety of dimensions, and it will take you approximately 5 minutes to complete.

You may not directly benefit from this research; however, we hope that your participation in the study may help to inform state policy concerning the needs of k-12 Louisiana public schools concerning their ability to support students through technology.

We believe there are no known risks associated with this research study; however, as with any online related activity the risk of a breach of confidentiality is always possible. To the best of our ability your answers in this study will remain confidential. We will minimize any risks by maintaining anonymity with participant responses and storing all responses in secure repositories.

Your participation in this study is completely voluntary and you can withdraw at any time.

If you have questions about this project or if you have a research-related problem, you may contact the researcher, **Jeffery Hand** (jhand1@lsu.edu). If you have any questions concerning your rights as a research subject, you may contact Dennis Landin at the Louisiana State University Institutional Review Board, (225) 578-8692, irb@lsu.edu, www.lsu.edu/irb.

By clicking “I agree” below you are indicating that you are at least 18 years old, have read and understood this consent form and agree to participate in this research study. Please print a copy of this page for your records.

4

I Agree

4

I Do Not
Agree

APPENDIX B

PARTICIPANT CONSENT FORM

1. Study Title:

Louisiana School Leaders' Perceptions of K-12 Online Education Readiness

2. Performance Site:

Louisiana State University and Agricultural and Mechanical College, Baton Rouge, LA

3. Investigators:

The following investigators are available for questions about this study,
M-F, 8:00 a.m. - 4:30p.m.

Jeffery Hand, Ph.D. Candidate

1(623) 341-0179

Jhand1@lsu.edu

4. Purpose of the Study:

The purpose of this quantitative, descriptive study was to gain perspective Louisiana School Leaders' perceptions of their levels of preparedness to effectively integrate technology into their schools as a major component of their educational program.

5. Subject Inclusion:

Louisiana k-12 public school leaders

6. Number of subjects: 1350

7. Study Procedures:

Participants will be emailed an invitation to complete the Principals Technology Leadership Assessment Survey, via Survey Monkey. Those wishing to participate in the study will click the embedded web link to the electronic survey. The attached consent form will be displayed electronically and will prompt participants to click that they affirm their consent prior to beginning the survey.

8. Benefits:

Subjects will be offered no benefits other than the opportunity to contribute to this important study.

9. Risks:

The survey is anonymous and does not include sensitive or personally-identifiable questions or information. Every effort will be made to maintain the confidentiality of survey records. Paper copies of the survey results will be kept in secure cabinets to which only the investigator has access.

10. Right to Refuse:

Subjects may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which they might otherwise be entitled.

11. Privacy:

Results of the study may be published, but no names or identifying information will be included in the publication. Subject identity will remain confidential unless disclosure is required by law.

Your participation in this study is completely voluntary and you can withdraw at any time.

If you have questions about this project or if you have a research-related problem, you may contact the researcher, **Jeffery Hand** (jhand1@lsu.edu). If you have any questions concerning your rights as a research subject, you may contact Dennis Landin at the Louisiana State University Institutional Review Board, (225) 578-8692, irb@lsu.edu, www.lsu.edu/irb.

By clicking “I agree” below you are indicating that you are at least 18 years old, have read and understood this consent form and agree to participate in this research study. Please print a copy of this page for your records.

4

I Agree

4

I Do Not
Agree

APPENDIX C

PRINCIPALS TECHNOLOGY LEADERSHIP ASSESSMENT



PRINCIPALS TECHNOLOGY LEADERSHIP ASSESSMENT

- Dissemination and Licensing -

The Principals Technology Leadership Assessment (PTLA) is intended to assess principals' technology leadership inclinations and activities over the course of the last school year (or some other fixed period of time). Based on ISTE's National Educational Technology Standards for Administrators (NETS-A), the PTLA was developed and psychometrically validated by the American Institutes for Research as part of a grant CASTLE received from the United States Department of Education Fund for the Improvement of Postsecondary Education (FIPSE).

The PTLA will be made available to K-12 school organizations and educational leadership preparation programs as follows:

1. **PDF Download.** School organizations can download the PTLA assessment and instructions in PDF format. Organizations are responsible for their own data entry and analysis using Excel, SPSS, or some other data analysis software program. This option is free to K-12 school organizations and educational leadership preparation programs.
2. **Questions Download.** School organizations can download the questions on the PTLA assessment in Microsoft Word format. The questions then can be cut-and-pasted into organizations' own online survey software. Organizations are responsible for their own data analysis using Excel, SPSS, or some other data analysis software program. This option is free to K-12 school organizations and educational leadership preparation programs.

3. **CASTLE online survey.** Organizations are welcome to use CASTLE’s own online version of the PTLA. CASTLE staff will send the resultant data file to organizations in Excel format. Organizations are responsible for their own data analysis using Excel, SPSS, or some other data analysis software program. This option is free to K-12 school organizations and educational leadership preparation programs if they grant CASTLE permission to use the data (anonymously) as part of its ongoing nationwide research related to principals’ technology leadership knowledge and preparation.

4. **CASTLE online survey and data analysis.** CASTLE not only will host the online version of the PTLA for organizations but also will analyze the data for them. This option is available to K-12 school organizations and educational leadership preparation programs on the same terms as Option 3 but also will involve a small charge per PTLA participant to cover CASTLE’s personnel and time costs.

CASTLE believes in making the PTLA as freely available as possible to school organizations. The PTLA also is available for a small licensing fee to for-profit corporations and other entities that stand to make money from their usage of the PTLA. We are open to other creative possibilities for the PTLA; please contact us if you are interested in using this assessment.

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Human Development
University of Minnesota

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www.schooltechleadership.org



INSTRUCTIONS

Principals Technology Leadership Assessment

You are being given this technology leadership assessment at the request of your school or district, which will use the results to guide its leadership training and professional development programming. Assessment items are based on the International Society for Technology in Education's (ISTE) National Educational Technology Standards for Administrators (NETS-A). The purpose of the assessment is to provide building-level administrators with detailed and comparative information about their technology leadership.

The individual items in the assessment ask you about the extent to which you have engaged in certain behaviors that relate to K-12 school technology leadership. Answer as many of the questions as possible. If a specific question is not applicable, leave it blank. For example, if a question asks about technology planning activities in your district, and your district has not engaged in any such activities, leave the item blank. Note that leaving multiple items blank may limit the usefulness of the assessment results.

As you answer the questions, think of your actual behavior over the course of the last school year (or some other fixed period of time). Do not take into account planned or intended behavior. As you select the appropriate response to each question, it may be helpful to keep in mind the performance of other principals that you know. ***Please note that the accuracy and usefulness of this assessment is largely dependent upon your candor.*** If done with care, the results can provide you with valuable information as you seek to extend or improve your leadership skills. When assessing behaviors and performance, individuals have a tendency to make several types of errors. You should familiarize yourself with the following errors:

Leniency error. This occurs when an individual gives himself an assessment higher than he deserves. This could occur for several reasons: the individual has relatively low performance

standards for himself; the individual assumes that other individuals also inflate their ratings; or, for social or political reasons, the individual judges that it would be better not to give a poor assessment. As you assess yourself, you should understand that accurate feedback will provide you with the best information from which to base further improvement.

Halo error. This occurs when an individual assesses herself based on a general impression of her performance or behavior, and the general impression is allowed to unduly influence all the assessments given. An example of halo error would be an individual who rates herself highly on every single assessment item. It is rare that individuals perform at exactly the same level on every dimension of leadership. It is more likely that an individual performs better in some areas than on others.

Recency error. This occurs when an individual bases an assessment on his most recent behavior, as opposed to his entire behavior over some fixed period of time (e.g., the last year). This assessment should be based on your behavior over the entire year (or other fixed period of time). The following terms appear throughout the assessment. Keep these definitions in mind as you read the items and make your response.

Technology. Generally, refers to personal computers, networking devices and other computing devices (e.g., electronic whiteboards and personal digital assistants (PDAs)); also includes software, digital media, and communications tools such as the Internet, e-mail, CD-ROMs, and video conferencing.

Technology planning. Any process by which multiple stakeholder groups (e.g., district administration, school administration, faculty, and parents) convene to develop a strategy for the use or expanded use of technology in instruction and operations. Technology planning need not

be separate from other planning efforts, but should be a recurring theme if integrated within a more comprehensive planning process.

Research-based. A practice that employs systematic, empirical methods that draw on observation or experiment to provide reliable data. Research-based work uses research designs and methods appropriate to the research question posed and are presented in sufficient detail for replication. The strongest research-based practices typically obtain acceptance through peer-reviewed journals or expert panels.

Assessment. A method of measurement used to evaluate progress. Student assessment typically refers to a method of evaluating student performance and attainment to determine whether or not a student is achieving the expected outcome(s).

Average time to complete the assessment is about 15 minutes.

I. Leadership & Vision

1. To what extent did you participate in your district's or school's most recent technology planning process?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

2. To what extent did you communicate information about your district's or school's technology planning and implementation efforts to your school's stakeholders?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

3. To what extent did you promote participation of your school's stakeholders in the technology planning process of your school or district?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

4. To what extent did you compare and align your district or school technology plan with other plans, including district strategic plans, your school improvement plan, or other instructional plans?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

5. To what extent did you advocate for inclusion of research-based technology practices in your school improvement plan?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

6. To what extent did you engage in activities to identify best practices in the use of

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

technology (e.g. reviews of literature, attendance at relevant conferences, or meetings of professional organizations)?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

II. Learning and Teaching

1. To what extent did you provide or make available assistance to teachers to use technology for interpreting and analyzing student assessment data?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

2. To what extent did you provide or make available assistance to teachers for using student assessment data to modify instruction?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

3. To what extent did you disseminate or model best practices in learning and teaching with technology to faculty and staff?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

4. To what extent did you provide support (e.g., release time, budget allowance) to teachers or staff who were attempting to share information about technology practices, issues, and concerns?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

5. To what extent did you organize or conduct assessments of staff needs related to professional development on the use of technology?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

6. To what extent did you facilitate or ensure the delivery of professional development on the use of technology to faculty and staff?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

III. Productivity & Professional Practice

1. To what extent did you participate in professional development activities meant to improve or expand your use of technology?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

2. To what extent did you use technology to help complete your day-to-day tasks (e.g., developing budgets, communicating with others, gathering information)?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

3. To what extent did you use technology-based management systems to access staff/faculty personnel records?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

4. To what extent did you use technology-based management systems to access student records?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

5. To what extent did you encourage and use technology (e.g., e-mail, blogs, videoconferences) as a means of communicating with education stakeholders, including peers, experts, students, parents/guardians, and the community?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

IV. Support, Management, & Operations

1. Support faculty and staff in connecting to and using district- and building-level technology systems for management and operations (e.g., student information system, electronic grade book, curriculum management system)?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

2. To what extent did you allocate campus discretionary funds to help meet the school's technology needs?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

3. To what extent did you pursue supplemental funding to help meet the technology needs of your school?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

4. To what extent did you ensure that hardware and software replacement/upgrades were incorporated into school technology plans?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

5. To what extent did you advocate at the district level for adequate, timely, and high-quality technology support services?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

6. To what extent did you investigate how satisfied faculty and staff were with the technology support services provided by your district/school?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

V. Assessment & Evaluation

1. To what extent did you promote or model technology-based systems to collect student assessment data?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

2. To what extent did you promote the evaluation of instructional practices, including technology-based practices, to assess their effectiveness?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

3. To what extent did you assess and evaluate existing technology-based administrative and operations systems for modification or upgrade?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

4. To what extent did you evaluate the effectiveness of professional development offerings in your school to meet the needs of teachers and their use of technology?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

5. To what extent did you include the effective use of technology as a criterion for assessing the performance of faculty?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

VI. Social, Legal, & Ethical Issues

1. To what extent did you work to ensure equity of technology access and use in your school?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

2. To what extent did you implement policies or programs meant to raise awareness of technology-related social, ethical, and legal issues for staff and students?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

3. To what extent were you involved in enforcing policies related to copyright and intellectual property?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

4. To what extent were you involved in addressing issues related to privacy and online safety?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

5. To what extent did you support the use of technology to help meet the needs of special education students?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

6. To what extent did you support the use of technology to assist in the delivery of individualized education programs for all students?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

7. To what extent did you disseminate information about health concerns related to technology and computer usage in classrooms and offices?

Not at all	Minimally	Somewhat	Significantly	Fully
1	2	3	4	5

VITA

Jeffery A. Hand, a native of Baton Rouge, Louisiana, received his Bachelor's degree from Louisiana State University (LSU) and his Master's Degree in Educational Leadership from Arizona State University. He has served in the K-12 public school setting with roles ranging from classroom teacher, building level administrator, state office official and school district central office executive staff. He was accepted into LSU's College of Human Sciences and Education Doctoral Program and anticipates graduating with his Ph.D. degree in May 2016. His intentions are to stay within the K-12 public setting and utilize the vast array of resources, experience and meaningful outcomes LSU has offered him.